工 程 学 院

- **地质工程专业培养方案**

  地质工程实验班

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- **土木工程专业培养方案**

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- **勘查技术与工程专业培养方案(卓越工程师教育培养计划)**
- **安全工程专业培养方案**

地质工程专业培养方案

专业名称与代码：地质工程 081401

专业培养目标：

本专业培养知识、能力、素质各方面全面发展的、爱国的、遵纪守法的社会主义事业合格建设者和接班人；系统掌握地质工程专业基本理论、基本方法、基本技能和学科交叉与专业交融的知识，接受相关的工程训练，具有具有艰苦朴素、求真务实、与时俱进与创新创业精神，能在国土资源、水利水电、能源矿业、交通运输、城乡建设等领域从事与地质工程相关的勘察、设计、施工、监理、检测和管理等工作的具有国际视野的复合应用型工程技术人才。毕业 5 年左右能够在社会及地质工程领域担任业务骨干、技术负责或项目管理人才。

培养目标可以分解为四个子目标，分述如下：

培养子目标 1：培养坚持以马克思列宁主义、毛泽东思想、邓小平理论、三个代表及科学发展观为指导，遵纪守法、乐于贡献、德智体美劳与健康个性和谐统一、全面发展的社会主义事业合格建设者和接班人。

培养子目标 2：在坚持“宽口径、厚基础、强素质、重应用”的前提下，立足国际化、信息化、一体化发展的要求，着眼国内市场化、专业化、社会化的发展趋势，以地质学理论、力学理论为基础，培养系统掌握地质工程专业的基本理论、基本方法和基本技能的人才，并具备学科交叉与专业交融的知识。

培养子目标 3：具有综合运用地质工程专业知识解决复杂工程实际问题的综合能力，一定国际视野和跨文化交流、竞争与合作的初步能力；具备地质工程新技术、新方法创新和开发的基本能力。

培养子目标 4：能在国土资源、水利水电、能源矿业、交通运输、城乡建设等领域的勘察、设计、施工、监理、检测和管理单位从事地质工程勘察设计与施工、地质灾害防治与地质环境保护、资源勘探与采掘、岩土钻掘与工程监理等工作，且具有创新创业精神、实践能力和国际视野的复合应用型工程技术人才。

专业毕业要求：

（1）工程知识：能够将数学、自然科学、工程基础和专业知识用于解决地

质工程中的复杂工程问题。

（2）问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析地质工程专业中的复杂工程问题，以获得有效结论。

（3）设计/开发解决方案：能够设计针对地质工程中的复杂工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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：能够基于科学原理并采用科学方法对地质工程中的复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

（5）使用现代工具：能够针对地质工程中的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。

（6）工程与社会：能够基于地质工程相关背景知识进行合理分析，评价地质工程专业的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。

（7）环境和可持续发展：能够理解和评价针对地质工程中的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。

（8）职业规范：具有人文社会科学素养、社会责任感，能够在地质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：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。

（10）沟通：能够就地质工程中的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。

（11）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。

（12）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。

毕业要求及实现途径

序号	毕业要求	实现途径（教学过程）
1	工程知识：能够将数学、自然科学、工程基础和专业知识用于解决复杂工程问题。	① 课堂教学：高等数学 B、大学物理 C、物理实验 A、线性代数 B、概率论与数理统计 B、大学化学、建筑制图、工程力学、弹塑性力学基础、结构力学 B、流体力学、钢筋混凝土结构原理、机械制图课程设计 ② 课外学习：专题讲座、学术报告等。
2	问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析复杂工程问题，以获得有效结论。	① 课堂教学：普通地质学、矿物岩石学 A、构造地质学 A、地貌学及第四纪地质学、岩体力学、土力学、地下水动力学 B、地质认识实习（北戴河）、地质教学实习（周口店）、专业教学实习（工程地质秭归）、地质学基础、电工与电子技术基础、机械设计基础 A、金属材料与零件加工、液压传动、金工实习 B、工程地质教学实习（秭归）、地质工程教学实习、非开挖工程学 ② 课外学习：课程作业、大学生科研立项、学科前沿调研报告等。
3	设计/开发解决方案：能够设计针对复杂工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。	① 课堂教学：水文地质学基础 B、工程地质学基础 A、工程地质勘察、地质灾害防治、工程地质学基础 B、岩土钻掘工艺学、钻井液与工程浆液、岩土钻掘设备、基础工程施工技术、金刚石工具设计与制造。 ② 课外学习：课程作业、大学生科研立项、学科前沿调研报告等。
4	研究：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、分析与解释数据、并通过信息综合得到合理有效的结论。	① 课堂教学：测量学 A、测量教学实习 A、工程钻探与取样技术、工程物探、岩土工程监测、岩土工程勘察、水文水井与地热钻井、检测技术、桩基检测。 ② 课外学习：课程作业、大学生科研立项、学科前沿调研报告、学科竞赛、发明创造、科研报告等。

5	使用现代工具：能够针对复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性。	① 课堂教学：C 语言程序设计、C 语言课程设计 B、工程地质数值模拟技术与应用。 ② 课外学习：课程作业、大学生科研立项、学科前沿调研报告等。
6	工程与社会：能够基于工程相关背景知识进行合理分析，评价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，并理解应承担的责任。	① 课堂教学：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、体育、军事理论、土木工程概论、通识教育选修课、军事训练、社会调查。 ② 课外学习：课程作业、大学生科研立项、专题讲座等。
7	环境和可持续发展：能够理解和评价针对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。	① 课堂教学：工程导论、通识教育选修课、地基处理、建筑材料、工程地质专业讲座、道路勘察设计、地下建筑结构、基础工程学 A、新技术专题报告、边坡处治工程、 ② 课外学习：工程作业、大学生科研立项、专题讲座等。
8	职业规范：具有人文社会科学素养、社会责任感，能够在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：马克思主义原理、思想道德修养与法律基础、工程导论、通识教育选修课、土木工程概论。 ② 课外学习：入学教育、大学生心理健康教育、形势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等。
9	个人和团队：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：通识教育选修课、地质认识实习（北戴河）、地质教学实习（周口店）、专业教学实习（工程地质秭归）、毕业实习、工程地质教学实习（秭归）、地质工程教学实习、地质工程生产实习。 ② 课外学习：入学教育、大学生心理健康教育、形势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等。

10	沟通：能够就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：大学英语、通识教育选修课、工程地质专业讲座。 ② 课外学习：学科前沿调研报告、科技论文报告会、学术讲座、撰写科技论文、参加教师科研项目等。
11	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：思想道德修养与法律基础、工程导论、通识教育选修课、工程招投标与概预算、工程项目管理、土木工程概论。 ② 课外学习：大学生科研立项、生产实习、参加教师科研项目等。
12	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：通识教育选修课、地质灾害防治课程设计、工程地质勘察课程设计、工程地质学基础课程设计、毕业实习、毕业设计、社会调查、机械制图课程设计、基础工程课程设计、钻探工艺学课程设计、毕业实习和设计/论文、 ② 课外学习：课程作业、学科竞赛、发明创造、科研报告、大学生科研立项等。

Program for Geology Engineering (2015)

Specialty and Code: Geology Engineering 081401

Education Objective:

This major aims to train students to become patriotic, law-abiding and qualified constructer and successor of socialist cause with comprehensive development of knowledge, ability and quality. They are expected to systematically master the principal theory, basic methods and skills of geological engineering and interdisciplinary knowledge, participate in professional engineering training, and have the spirits of plain living, seeking truth, pragmatically working, innovation and entrepreneurship. So that they can be engineering and technical talents with international perspectives who are competent in investigation, design, construction, supervision, detection and management of geological engineering projects in the fields of land and resources, water resources and hydropower, energy and mines, transportation and urban and rural construction.. Graduates, after about 5 years, are expected to be technology director, business leader or project manager in society and/or geological engineering fields.

The education objective can be divided into four sub-objectives as follows:

Sub-objective 1: Guided by Marxism , Maoism, Deng Xiaoping Theory, thought of Three Represents and Scientific Outlook on Development, this major aims to train students to become law-abiding, dedicated and qualified constructer and successor of socialist cause with comprehensive development of moral, intellectual, physical, aesthetic and labor education.

Sub-objective 2: On the premise of training students of “broad knowledge, solid foundation, top quality and applicability”, and to meet the requirements of internationalization, informatization and integrative development, this major aims to train students to become talents mastering the principal theory, basic methods and skills of engineering geology and rock-soil drilling based on geology theory and mechanics, and having interdisciplinary knowledge.

Sub-objective 3: Students are required to be able to work out complex engineering problems with a comprehensive application of professional knowledge. They are also supposed to possess international perspective, the ability of intercultural communication, competition and cooperation, and the basic ability of innovating and developing new technology and methods in geology engineering.

Sub-objective 4: Students are trained to become engineering and technical talents with innovation spirit, practical ability and international perspectives, who are competent in engineering geological investigation, geological disaster prevention and control, geological environment conservation, geological engineering design and construction, resource exploration and excavation, rock/soil drilling and project supervision in the fields of land and resources, water resources and hydropower, energy and mines, transportation and urban and rural construction.

Graduation Requirements:

1. Engineering knowledge: Students are required to be able to use mathematics, natural science, engineering basis and professional knowledge to solve complex geological engineering problems;

2. Problem analysis: Students are expected to be able to identify, express and analyze complex geological engineering problems through literature research, and obtain valid conclusions using basic principles of applied mathematics, natural science and solid mineral exploration theory;

3. Solution design/development: Students are asked to be able to provide solutions for complex geological engineering problems, design system, unit (component) or technical process which meet the specific needs, and embody the sense of innovation and consider social, health, safety, law, culture and environment factors in the design processes;

4. Research: Students are required to be able to carry out the research on complex geological engineering problems based on principles of science and scientific methods which include experimental design, data analysis and interpretation, and to draw reasonable and reliable conclusions through information synthesis;

5. Modern tools application: Students are expected to be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools to solve out complex geological engineering problems, including prediction and modeling of complex engineering problems and understanding its limitations;

6. Engineering and society: Students are asked to be able to analyze social problems based on geological engineering related background knowledge, evaluate impacts on society, health, safety, law and culture during the solution process of complex engineering problems, and understand the responsibilities that should be borne;

7. Environment and sustainable development: Students are supposed to be able to understand and evaluate impacts of professional engineering practice for the complex geological engineering problems on environment and sustainable development of society;

8. Professional standard: Students are expected to obtain humanities and social science literacy and social responsibility, and be able to understand and comply with the engineering ethics and standards in the practice of geological engineering, and fulfill the responsibility;

9. Individual and team work: Students are required to be able to assume the role of individual, team member, and the person in charge;

10. Communication: Students are asked to be able to effectively communicate and exchange with industry peers and the public on complex geological engineering problems, including report writing, document designing, statement presenting, opinion expressing and instruction responding. Students should also have a certain international perspective, and can exchange and communicate in cross-cultural settings;

11. Project management: Students are asked to be able to understand and master the engineering management principles and economic decision-making methods, and apply them in multi discipline environment;

12. Life-time learning: Students should have autonomous and lifelong learning consciousness, and possess the ability of continuous learning and development adapting.

Graduation Requirements and Ways to Achieve

No.	Graduation Requirements	Ways to Achieve (Teaching Process)
1	Engineering knowledge: Students are required to be able to use mathematics, natural science, engineering basis and professional knowledge to solve complex geological engineering problems	① Classroom Teaching: Advanced Mathematics B, College Physics C, Physics Experiments A, Linear Algebra B, Probability and Mathematics Statistics B, College Chemistry, Building Engineering Graphics, Engineering Mechanics, Principle of Elastic and Plastic Mechanics, Structure Mechanics B, Hydromechanics, Reinforced Concrete Structure, Course design of Mechanical drawing B ② Out-of-class Learning: Lectures on special topics, Academic report, etc.
2	Problem analysis: Students are expected to be able to identify, express and analyze complex geological engineering problems through literature research, and obtain valid conclusions using basic principles of applied mathematics, natural science and solid mineral exploration theory	① Classroom Teaching: General Geology, Mineralogy and Petrology A, Tectonics A, The Geomorphology and Quaternary Geology, Rock Mass Mechanics, Soil Mechanics, Dynamics of Groundwater B, Primary Geological Field Training (Beidaihe), Geology Field Training (Zhoukoudian), Professional Teaching Practice (Zigui), Fundamentals of Geology, Electrical Engineering and Electrical Technology B, Fundamentals of

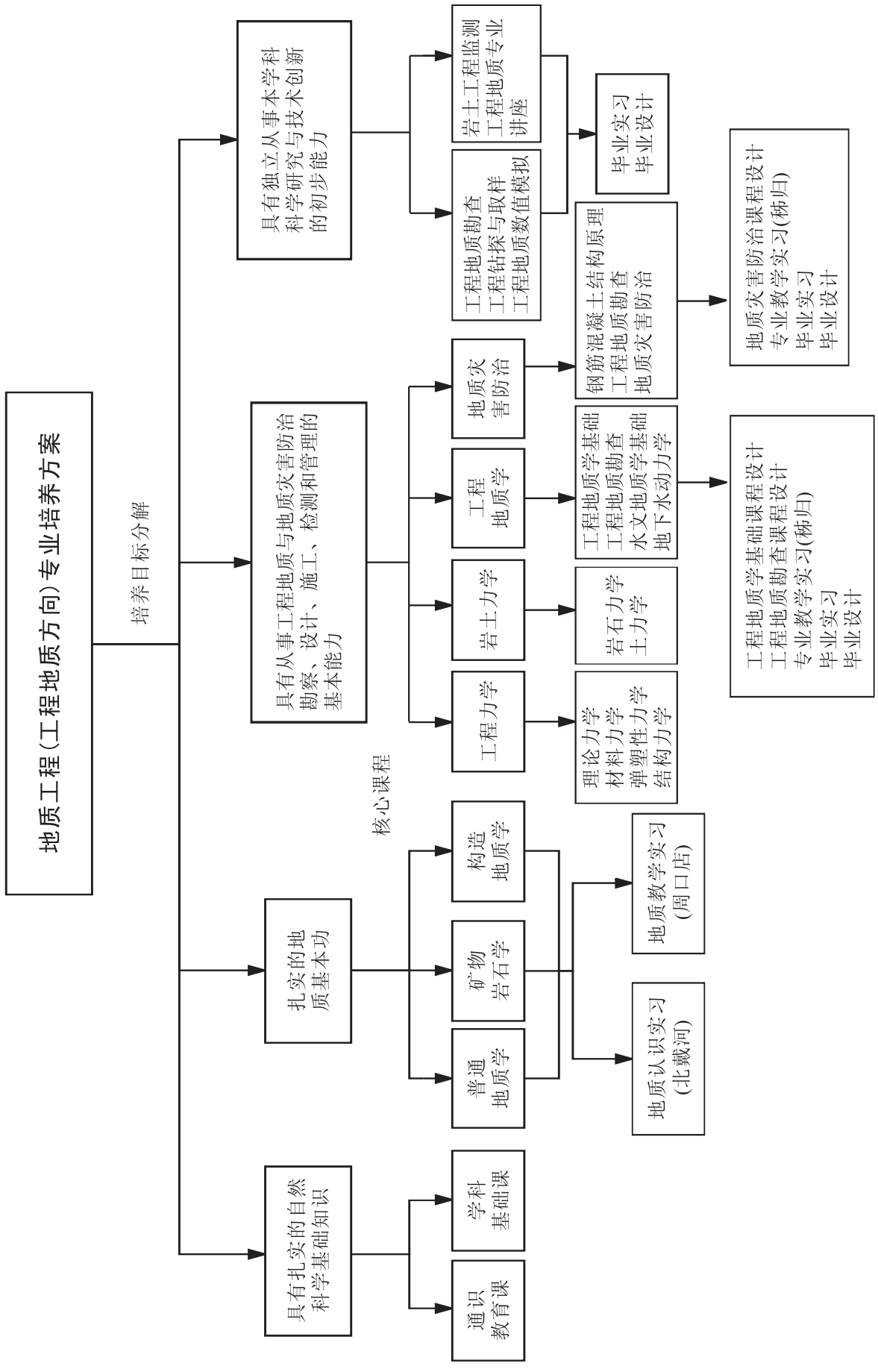
		Mechanical Design, Metal Materials and Their Processing, Hydraulic Control, Practice of Metal Processing Technique B, Geological Engineering teaching practice, Trenchless Engineering ② Out-of-class Learning: Course homework, Student Research Training Plan, Survey Report of Academic Foreland, etc.
3	Solution design/development: Students are asked to be able to provide solutions for complex geological engineering problems, design system, unit (component) or technical process which meet the specific needs, and embody the sense of innovation and consider social, health, safety, law, culture and environment factors in the design processes	① Classroom Teaching: Principle of Hydrogeology B, Principle of Engineering Geology A, Engineering Geology Survey, Geological Hazard Control, Geotechnical drill dug technology, Drilling Fluids and Engineering Fluids, Geotechnical drill digging equipment, Construction Techniques of Foundation Engineering, Design and Manufacture of Diamond Tools ② Out-of-class Learning: Course homework, Student Research Training Plan, Survey Report of Academic Foreland, etc.
4	Research: Students are required to be able to carry out the research on complex geological engineering problems based on principles of science and scientific methods which include	① Classroom Teaching: Surveying A, Engineering Drilling and Sample, Engineering Geological Prospecting, Monitoring of Geotechnical Engineering, Engineering Geologic Exploration, Instructive Practice for Engineering

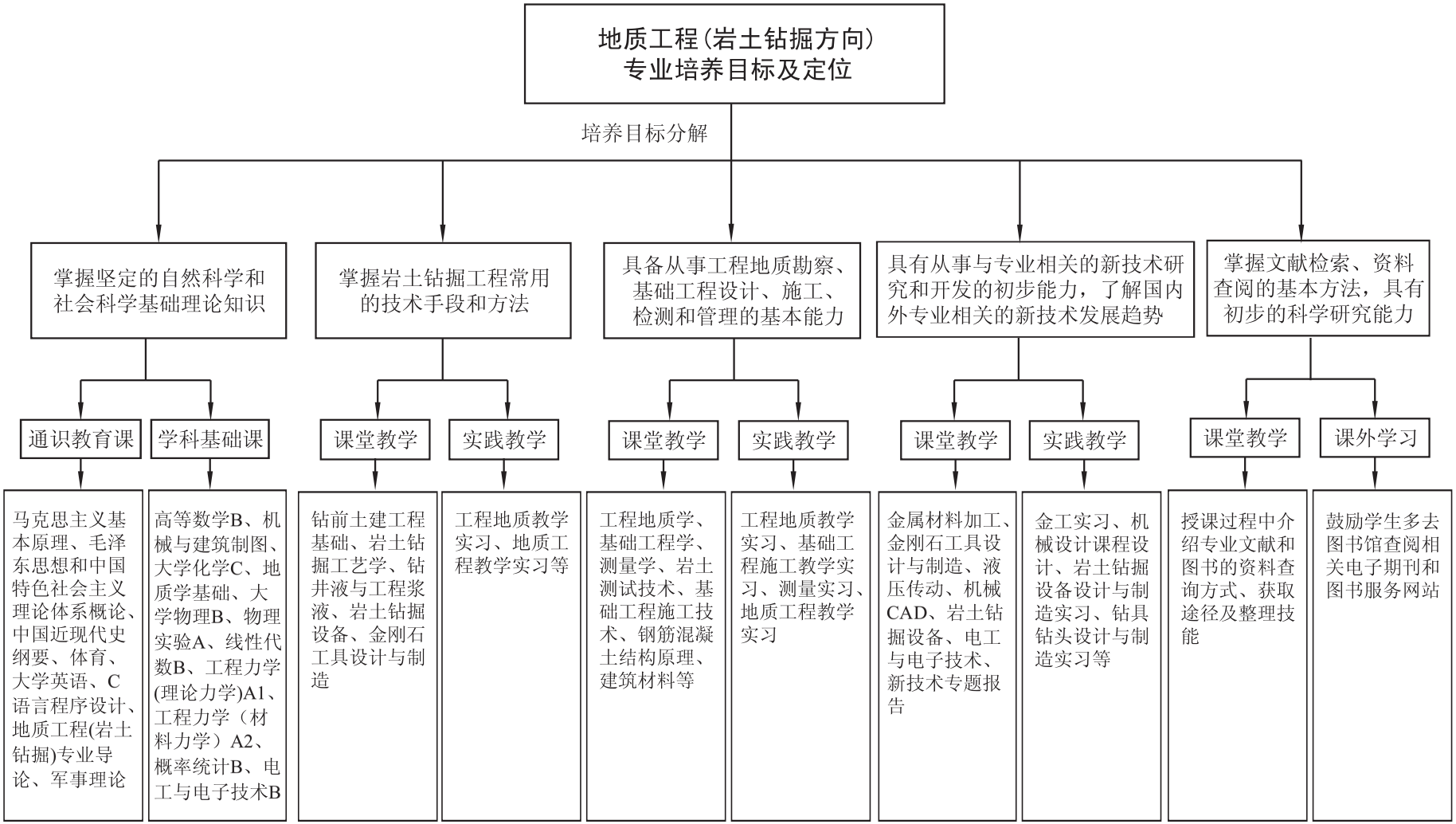
	experimental design, data analysis and interpretation, and to draw reasonable and reliable conclusions through information synthesis	Surveying A, Pile Detection, Hydrological Wells and geothermal drilling, Detection technology ② Out-of-class Learning: Course homework, Student Research Training Plan, Survey Report of Academic Foreland, Contest, Invention, Innovation and Research Presentation, etc.
5	Modern tools application: Students are expected to be able to develop, select and use appropriate technology, resources, modern engineering tools and information technology tools to solve out complex geological engineering problems, including prediction and modeling of complex engineering problems and understanding its limitations	① Classroom Teaching: Computer program design with C Language, Course Design for Computer program design with C Language, Numerical simulation on Engineering Geology ② Out-of-class Learning: Course homework, Student Research Training Plan, Lectures on special topics, Survey Report of Academic Foreland, etc.
6	Engineering and society: Students are asked to be able to analyze social problems based on geological engineering related background knowledge, evaluate impacts on society, health, safety, law and culture during the solution process of complex engineering problems,	① Classroom Teaching: Introduction to Mao Tse-tung Thought and the Theoretical System of Socialism with Chinese Characteristics, The Essentials of Modern Chinese History, Physical Education, Military Theory, Introduction to Civil Engineering, Liberal Education Courses, Military training, Social Investigation

	and understand the responsibilities that should be borne	② Out-of-class Learning: Course homework, Student Research Training Plan, Lectures on special topics, etc.
7	Environment and sustainable development: Students are supposed to be able to understand and evaluate impacts of professional engineering practice for the complex geological engineering problems on environment and sustainable development of society	① Classroom Teaching: Introduction to Engineering, Liberal Education Courses, Foundation Engineering A, Foundation Treatment, Construction Material, Lecture on Engineering Geology, Road Survey and Design, Underground Construction Structure, Special Topics on New Technology, Slide slope Engineering ② Out-of-class Learning: Course homework, Student Research Training Plan, Lectures on special topics, etc.
8	Professional standard: Students are expected to obtain humanities and social science literacy and social responsibility, and be able to understand and comply with the engineering ethics and standards in the practice of geological engineering, and fulfill the responsibility	① Classroom Teaching: Principles of Marxism, Morality Education Fundamentals of Law, Introduction to Engineering, Introduction to Civil Engineering, Liberal Education Courses ② Out-of-class Learning: Entrance Education, Student Psychologically Healthy Education, Policy and Situation Education, Guide for Career, Education for Graduation, Special Lectures by Class Leader and Counselor, Academic Lecture, etc.
9	Individual and team work: Students are required to be able to assume the role of individual,	① Classroom Teaching: Liberal Education Courses, Primary Geological Field Training (Beidaihe), Geology Field

	team member, and the person in charge	Training (Zhoukoudian), Professional Teaching Practice (Zigui), Practice for Graduation, Geological Engineering teaching practice, Geological Engineering production practice ② Out-of-class Learning: Course homework, Student Research Training Plan, etc.
10	Communication: Students are asked to be able to effectively communicate and exchange with industry peers and the public on complex geological engineering problems, including report writing, document designing, statement presenting, opinion expressing and instruction responding. Students should also have a certain international perspective, and can exchange and communicate in cross-cultural settings	① Classroom Teaching: College English, Liberal Education Courses, Lecture on Engineering Geology ② Out-of-class Learning: Survey Report of Academic Foreland, Meeting on Scientific Research, Academic Lectures, Writing on Scientific Research, Taking part in Scientific Research Projects, etc.
11	Project management: Students are asked to be able to understand and master the engineering management principles and economic decision-making methods, and apply them in multi discipline	① Classroom Teaching: Morality Education Fundamentals of Law, Introduction to Engineering, Liberal Education Courses, Introduction to Civil Engineering, Engineering Bid and Budget, Engineering management ② Out-of-class Learning: Student

	environment	Research Training Plan, Practice for Graduation, Taking part in Scientific Research Projects, etc.
12	Life-time learning: Students should have autonomous and lifelong learning consciousness, and possess the ability of continuous learning and development adapting	① Classroom Teaching: Liberal Education Courses, Course Design for Geological Hazard Control, Course Design for Engineering Geology Survey, Course Design for Principle of Engineering Geology, Practice for Graduate 、Bachelor Thesis, Social Investigation 、Fundamentals of Mechanical Design B, Course design of Foundation engineering, Course design of Drilling Technology, Practice for Graduate and Bachelor Thesis ② Out-of-class Learning: Course homework, Subject contest, Invention and creation, Research report, Student Research Training Plan, etc.


地质工程(工程地质方向)专业培养方案
培养目标分解
具有扎实的自然科学基础知识
通识教育课
学科基础课
扎实的地质基本功
普通地质学
矿物岩石学
构造地质学
地质认识实习(北戴河)
地质教学实习(周口店)
具有从事工程地质与地质灾害防治勘察、设计、施工、检测和管理的基本能力
核心课程
工程力学
理论力学
材料力学
弹塑性力学
结构力学
岩土力学
岩石力学
土力学
工程地质学
工程地质学基础
工程地质勘查
水文地质学基础
地下水动力学
地质灾害防治
钢筋混凝土结构原理
工程地质勘查
地质灾害防治
具有独立从事本学科科学研究与技术创新的初步能力
工程地质勘查
工程钻探与取样
工程地质数值模拟
岩土工程监测
工程地质专业讲座
毕业实习
毕业设计
工程地质学基础课程设计
工程地质勘查课程设计
专业教学实习(秭归)
毕业实习
毕业设计
地质灾害防治课程设计
专业教学实习(秭归)
毕业实习
毕业设计


地质工程(岩土钻掘方向)
专业培养目标及定位
培养目标分解
掌握坚定的自然科学和社会科学基础理论知识
掌握岩土钻掘工程常用的技术手段和方法
具备从事工程地质勘察、基础工程设计、施工、检测和管理的基本能力
具有从事与专业相关的新技术研究和开发的初步能力，了解国内外专业相关的新技术发展趋势
掌握文献检索、资料查阅的基本方法，具有初步的科学研究能力
通识教育课
学科基础课
课堂教学
实践教学
课堂教学
实践教学
课堂教学
实践教学
课堂教学
课外学习
马克思主义基本原理、毛泽东思想和中国特色社会主义理论体系概论、中国近现代史纲要、体育、大学英语、C语言程序设计、地质工程(岩土钻掘)专业导论、军事理论
高等数学B、机械与建筑制图、大学化学C、地质学基础、大学物理B、物理实验A、线性代数B、工程力学(理论力学)A1、工程力学（材料力学）A2、概率统计B、电工与电子技术B
钻前土建工程基础、岩土钻掘工艺学、钻井液与工程浆液、岩土钻掘设备、金刚石工具设计与制造
工程地质教学实习、地质工程教学实习等
工程地质学、基础工程学、测量学、岩土测试技术、基础工程施工技术、钢筋混凝土结构原理、建筑材料等
工程地质教学实习、基础工程施工教学实习、测量实习、地质工程教学实习
金属材料加工、金刚石工具设计与制造、液压传动、机械CAD、岩土钻掘设备、电工与电子技术、新技术专题报告
金工实习、机械设计课程设计、岩土钻掘设备设计与制造实习、钻具钻头设计与制造实习等
授课过程中介绍专业文献和图书的资料查询方式、获取途径及整理技能
鼓励学生多去图书馆查阅相关电子期刊和图书服务网站

地质工程(实验班)专业课程教学计划表

Course Descriptions of Geological Engineering(Experimental Class)

课程类别 Course Classification		课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 Principles of Marxism	3	48	48	0			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	0				4					
		11711800	中国近现代史纲要 The Essentials of Modern Chinese History	2	32	32	0					2				
		120002 * 0	思想道德修养与法律基础 Morality Education and Fundamentals of Law	3	48	48	0		1.5	1.5						
		113076 * 0	体育 Physical Education	4	144	144	0		1	1	1	1				
		109116 * 0	大学英语 College English	12	192	192	0		3	3	3	3				
		11918902	C 语言程序设计 B C Language Programming B	2.5	40	28	12		2.5							
		20520200	工程导论 Introduction to Engineering	1	16	16	0		1							
		14300100	军事理论 Military Theory	2	32	32	0		2							
	选修 Elective	总计 12 学分,含创新创业选修课学分,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**	**604**	**12**		**11**	**8.5**	**8**	**6**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127 * 2	高等数学 B Advanced Mathematics B	10	160	160	0		4	6						
		212130 * 3	大学物理 C College Physics C	6	96	96	0			3.5	2.5					
		212132 * 1	物理实验 A Physical Experiments A	3.5	56	0	56			2	1.5					
		20302403	大学化学 C College Chemistry C	4	64	50	14		4							
		21213502	线性代数 B Linear Algebra B	2.5	40	40	0				2.5					

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
学科基础课 Disciplinary Fundamental Courses	21213502	概率论与数理统计 B Probability and Mathematics Statistics B	2.5	40	40	0					2.5				
	207247＊0	机械制图 Mechanical Drawing	5.5	88	88	0		3	2.5						
	20508011	工程力学(理论力学)A1 Engineering Mechanics (Theoretical Mechanics) A1	5	80	76	4				5					
	20508021	工程力学(材料力学)A2 Engineering Mechanics (Theoretical Mechanics) A2	4.5	72	62	10					4.5				
	21114302	测量学 A Surveying A	2.5	40	30	10			2.5						
	20114900	普通地质学 Physical Geology	3	48	38	10		3							
	20113100	矿物岩石学 Mineralogy and Petrology	2.5	48	38	10	普通地质学		2.5						
	20104002	构造地质学 B Tectonics B	3	48	40	8	普通地质学			3					
	小计 **Sum**		**54.5**	**880**	**758**	**122**		**14**	**19**	**14.5**	**7**	**0**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20512302	结构力学 B Structural Mechanics B	3.5	56	48	8	工程力学					3.5			
	20530301	土力学 A Soil Mechanics A	4	64	52	12	工程力学					4			
	20520500	岩体力学 A Rock Mass Mechanics A	3	48	40	8	工程力学					3			
	20409102	水文地质学基础 B Hydrogeology B	2.5	40	34	6						2.5			
	20530001	工程地质学基础 A Principles of Engineering Geology A	3.5	56	56	0							3.5		
	20520500	岩土钻掘工艺学 Geotechnical Drilling Engineering	3	48	40	8							3		
	20530100	岩土工程勘察 Engineering Geology Survey	4	64	64	0							4		
	小计 **Sum**		**23.5**	**376**	**334**	**42**		**0**	**0**	**0**	**0**	**13**	**10.5**	**0**	**0**

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业选修课 Specialty Elective Courses		具体见专业选修课列表	24	384											
合计 **Sub-total**			**147.5**	**2448**	**1696**	**176**		**25**	**27.5**	**22.5**	**13**	**13**	**10.5**	**0**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41919002	C 语言课程设计 B Course Design for C Language B	1.5	1.5 周				1.5							
	41120901	测量教学实习 A Surveying Practice A	1	1 周					1						
	40115200	地质认识实习(北戴河) Primary Field Training(Beidaihe)	2	2 周			普通地质学		2						
	40115602	地质教学实习(周口店) B Geological Field Training (Zhoukoudian) B	4	4 周			构造地质				4				
	40529700	专业教学实习(工程地质,秭归) Professional Teaching Practice (Engineering Geology, Zigui)	4	4 周			工程地质基础						4		
	40529200	专业教学实习(岩土钻掘) Professional Teaching Practice(Geotechnical Drilling, in the School)	3	3 周							3				
	40529300	岩土工程勘察课程设计 Course Design of Engineering Geology Survey	1	1 周									1		
	40529400	岩土钻掘工程课程设计 Course Design of Geotechnical Drilling Engineering	1	1 周									1		
	40724800	机械制图课程设计 Course Design of Mechanical Drawing	0.5	0.5 周					0.5						
	40529500	毕业实习 Practice for Graduation	8	8 周											8
	40529600	毕业设计 Design for Graduation	8	8 周											8
	小计 **Sum**		**36**	**36 周**	**0**	**0**		**3.5**	**3.5**	**0**	**7**	**0**	**6**	**0**	**16**

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
创新创业自主学习 Autonomous Learning	ZZ35000S	社会调查 Social Investigation	2												
		其他（学科竞赛、发明创造、科研报告） Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 **Sum**		**6**												
总计 **Total**			**189.5**	**2448＋36周**	**1696**	**176**		**28.5**	**31**	**22.5**	**20**	**13**	**16.5**	**0**	**16**
可开出专业选修课列表 Specialty Elective Courses	209203＊0	英语口语（外教） Spoken English(Foreign teacher)	2	32	32						1	1			
	20529900	欧美科技文化与国际学术交流 Occident Technological Culture and International Academic Exchanges	2	32	16	16							2		
	20511200	建筑材料 Construction Materials	2	32	26	6					2				
	20506000	地质灾害防治 Geological Hazards Control	2	32	32	0	工程地质基础						2		
	20509500	工程招标投标与概预算 Engineering Bidding and Budget	2	32	32									2	
	20103800	第四纪地质与地貌学 Geomorphology and Quaternary Geology	2	32	32						2				
	20400802	地下水动力学 B Dynamics of Groundwater B	2	32	28	4							2		
	20508300	工程地质数值模拟技术与应用 Numerical Simulation on Engineering Geology	2	32	32	0								2	
	20603500	工程物探 Engineering Geological Prospecting	2	32	32	0								2	
	20516200	土木工程概论 Introduction to Civil Engineering	2	32	32						2				
	20504602	地基处理 B Foundation Treatment B	2	32	32	0								2	
	20507301	钢筋混凝土结构原理 A Reinforced Concrete Structures A	3.5	56	56	0							3.5		

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
可开出专业选修课列表 Speciality Elective Courses	20506800	非开挖工程学 Trenchless Engineering	2	32	26	6							2		
	20517200	岩土测试技术 Geotechnique Test	2	32	32								2		
	20521500	岩土钻掘设备 Geotechnical Drilling Equipments	3	48	40	8							3		
	20530200	岩土工程监测 Monitoring of Geotechnical Engineering	2	32	32	0								2	
	20527900	工程项目管理 Engineering Management	2	32	32									2	
	20516000	土木工程法规 Civil Engineering Regulations	1	16	16						1				
	20510902	基础工程学 B Foundation Engineering B	2.5	40	40									2.5	
	20510700	基础工程施工技术 Techniques of Construction in Foundation Engineering	3	48	40	8								3	
	20711900	液压传动 Hydraulic Transmission	3	48	44	4						3			
	20521700	地下建筑结构 Underground Construction Structures	3.0	48	42	6							3		
	20521800	凿岩爆破 Rock Drilling and Blasting	3.0	48	40	8							3		
	20520800	钻井液与工程浆液 Drilling Fluids and Engineering Fluids	3	48	40	8							3		
	20509800	城市地下空间规划及利用 Urban Underground Space Planning and Utilization	2	32	24	8						2			
	20515400	水利水电工程地质 Engineering Geology for Hydraulic and Hydropower Project	2	32	32									2	
	20504200	弹塑性力学基础 Elastoplastic Mechanical Basis	3.5	56	50	6						3.5			
	20518400	新技术专题报告 Special Topics on New Technology	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。

地质工程(实验班)专业课程分类统计

Course Category Statistics of Geological Engineering(Experimental Class)

课程学分 / 统计	通识教育课 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	创新创业自主学习 Autonomous Learning	学时总计 Total Hours	学分总计 Total Credits
	必修 Compulsory	选修 Selective							
学时/学分 Hrs/Crs	616/33.5	192/12	880/54.5	376/23.5	384/24	36周/36	6	2448＋36周	189.5
学分所占比例 Proportion of Credits	24.01%		28.76%	12.4%	12.66%	19%	3.16%		100%

地质工程(工程地质方向)专业课程教学计划表

Course Descriptions of Geological Engineering Engineering(Engineer Geology)

课程类别 Course Classification		课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义原理 Principles of Marxism	3	48	48	0			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	0				4					
		11711800	中国近现代史纲要 The Essentials of Modern Chinese History	2	32	32	0					2				
		120002 * 0	思想道德修养与法律基础 Morality Education and Fundamentals of Law	3	48	48	0		1.5	1.5						
		113076 * 0	体育 Physical Education	4	144	144	0		1	1	1	1				
		109116 * 0	大学英语 B College English B	12	192	192	0		3	3	3	3				
		11918902	C 语言程序设计 B C Language Programming B	2.5	40	24	16		2.5							
		20520200	工程导论 Introduction to Engineering	1	16	16	0		1							
		14300100	军事理论 Military Theory	2	32	32	0		2							
	选修 Elective	总计 12 学分,含创新创业选修课学分,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**	**600**	**16**		**11**	**8.5**	**8**	**6**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127 * 2	高等数学 B Advanced Mathematics B	10	160	160	0		4	6						
		212130 * 3	大学物理 C College Physics C	6	96	96	0			3.5	2.5					
		212132 * 1	物理实验 A Physical Experiment A	3.5	56	0	56			2	1.5					
		21212802	线性代数 B Linear Algebra B	2.5	40	40	0				2.5					
		21213502	概率论与数理统计 B Probability and Mathematics Statistics B	2.5	40	40	0					2.5				

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
学科基础课 Disciplinary Fundamental Courses	20302403	大学化学 C College Chemistry C	4	64	50	14			4						
	20714600	建筑制图 Building Engineering Graphics	3.5	56	46	10		3.5							
	20508011	工程力学 A1(理论力学) Engineering Mechanics A1 (Theoretical Mechanics)	5	80	76	4				5					
	20508021	工程力学 A2(材料力学) Engineering Mechanics A2 (Materials Mechanics)	4.5	72	62	10					4.5				
	20504200	弹塑性力学基础 Principle of Elastic and Plastic Mechanics	3.5	56	52	4						3.5			
	21114302	测量学 A Surveying A	2.5	40	30	10		2.5							
	小计 **Sum**		**47.5**	**760**	**652**	**108**		**10**	**15.5**	**11.5**	**7**	**3.5**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20114900	普通地质学 Physical Geology	3	48	38	10		3							
	20113100	矿物岩石学 A Mineralogy and Petrology A	3	48	12	36			3						
	20104001	构造地质学 A Tectonics A	4	64	56	8					4				
	20108800	地貌学及第四纪地质学 The Geomorphology and Quaternary Geology	2	32	32						2				
	20512302	结构力学 B Structural Mechanics B	3.5	56	48	8						3.5			
	20520400	岩体力学 A Rock Mass Mechanics A	3	48	40	8						3			
	20530301	土力学 A Soil Mechanics A	4	64	52	12						4			
	20409102	水文地质学基础 B Principles of Hydrogeology B	2.5	40	32	8						2.5			
	20400802	地下水动力学 B Dynamics of Groundwater B	2	32	28	4							2		
	20519800	工程地质学基础 A Principles of Engineering Geology A	3.5	56	56	0							3.5		
	20530400	工程地质勘察 Engineering Geology Survey	4	64	64	0							4		
	20506000	地质灾害防治 Geological Hazard Control	2	32	32	0							2		
	小计 **Sum**		**36.5**	**584**	**490**	**94**		**3**	**3**	**0**	**6**	**13**	**11.5**	**0**	**0**

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业选修课 Specialty Elective Courses		具体见专业选修课列表	18	288											
合计 **Sub-total**			**148.5**	**2440**	**1742**	**218**		**24**	**27**	**19.5**	**19**	**16.5**	**11.5**	**0**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41120901	测量教学实习 A Instructive Practice for Engineering Surveying A	1	1 周				1							
	41919002	C 语言课程设计 B Course Design for C Language B	1.5	1.5 周				1.5							
	40530500	地质灾害防治课程设计 Course Design for Geological Hazard Control	1	1 周									1		
	40530600	工程地质勘察课程设计 Course Design for Engineering Geology Survey	2	2 周									2		
	40530700	工程地质学基础课程设计 Course Design for Principles of Engineering Geology	1.5	1.5 周									1.5		
	40115200	地质认识实习(北戴河) Primary Geological Field Training (Beidaihe)	2	2 周					2						
	40115602	地质教学实习(周口店) Geology Field Training (Zhoukoudian)	4	4 周							4				
	40529700	专业教学实习(工程地质种归) Professional Teaching Practice (Zigui)	4	4 周									4		
	40529500	毕业实习 Practice for Graduation	8	8 周											8
	40529600	毕业设计 Design for Graduation	8	8 周											8
	小计 **Sum**		**35**	**35** 周				**4.5**	**2**	**0**	**4**	**0**	**8.5**	**0**	**16**

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
创新创业自主学习 Autonomous Learning	ZZ35000S	社会调查 Social Investigation	2												
		其他（学科竞赛、发明创造、科研报告） Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 **Sum**		**6**												
总计 **Total**			**188.5**	**2440＋35周**	**1742**	**218**		**28.5**	**29**	**19.5**	**23**	**16.5**	**20**	**0**	**16**
可开出专业选修课列表 Specialty Elective Courses	20510902	基础工程学 B Foundation Engineering B	2.5	40	40	0								2.5	
	20504602	地基处理 B Foundation Treatment B	2	32	32	0								2	
	20509600	工程钻探与取样技术 Engineering Drilling and Sample	2	32	26	6								2	
	20603500	工程物探 Engineering Geological Prospecting	2	32	32	0								2	
	20520700	流体力学 Hydromechanics	2.5	40	36	4								2.5	
	20511200	建筑材料 Construction Materials	2	32	26	6						2			
	20507301	钢筋混凝土结构原理 A Principles of Reinforced Concrete Structure A	3.5	56	56	0							3.5		
	20516200	土木工程概论 Introduction to Civil Engineering	2	32	32	0						2			
	20530200	岩土工程监测 Monitoring of Geotechnical Engineering	2	32	32	0								2	
	20509500	工程招标投标与概预算 Engineering Bidding and Budget	2	32	32	0								2	
	20508300	工程地质数值模拟技术与应用 Numerical Simulation on Engineering Geology	2	32	32	0								2	
	20536500	工程地质专业讲座 Lectures on Engineering Geology	2	32	32	0								2	

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
可开出专业选修课列表 Specialty Elective Courses	20504500	道路勘察设计 Road Survey and Design	2.5	40	40	0							2.5		
	20521700	地下建筑结构 Underground Construction Structure	3.0	48	42	6							3.0		
	20514400	施工组织 Construction Organization	1.5	24	24	0								1.5	

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。

地质工程(工程地质方向)专业课程分类统计

Course Category Statistics of Geological Engineering(Engineer Geology)

课程学分 / 统计	通识教育课 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	创新创业自主学习 Autonomous Learning	学时总计 Total Hours	学分总计 Total Credits
	必修 Compulsory	选修 Selective							
学时/学分 Hrs/Crs	616/33.5	192/12	760/47.5	584/36.5	288/18	35 周/35	6	2440＋35 周	188.5
学分所占比例 Proportion of Credits	24.14%		25.19%	19.36%	9.55%	18.57%	3.18%		100%

地质工程(岩土钻掘方向)专业课程教学计划表

Course Descriptions of Geological Engineering (Rock & Soil Drilling & Tunnelling)

课程类别 Course Classification		课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32							2			
		120002＊0	思想道德修养与法律基础 Morality Education 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 C Language Programming B	2.5	40	28	12		2.5							
		20520200	工程导论 Introduction to Engineering	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**	**604**	**12**		**11**	**5.5**	**7**	**8**	**2**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127＊2	高等数学 B Advanced Mathematics B	10	160	160			4	6						
		207247＊0	机械制图 A Mechanical Drawing A	5.5	88	88			3	2.5						
		20302403	大学化学 C College Chemistry C	4	64	50	14			4						
		20115000	地质学基础 Fundamentals of Geology	4.5	72	62	10		4.5							
		212130＊3	大学物理 C College Physics C	6	96	96	0			3.5	2.5					

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
学科基础课 Disciplinary Fundamental Courses	212132 * 1	物理实验 A Physical Experiments A	3.5	56	0	56			2	1.5					
	21212802	线性代数 B Linear Algebra B	2.5	40	40					2.5					
	20508011	工程力学(理论力学)A1 Engineering Mechanics (Theoretical Mechanics) A1	5	80	80					5					
	20508021	工程力学(材料力学)A2 Engineering Mechanics (Mechanics of Materials) A2	4.5	72	72						4.5				
	21213502	概率论与数理统计 B Probability and Statistics B	2.5	40	40					2.5					
	20725102	电工与电子技术 B Electrician and Electronic Technology B	4	64	54	10						4			
	小计 **Sum**		**52**	**832**	**742**	**90**		**11.5**	**18**	**14**	**4.5**	**4**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	21120801	测量学 A Surveying A	2.5	40	30	10						2.5			
	20715201	机械设计基础 A Fundamentals of Mechanical Design A	3.5	56	46	10						3.5			
	20723600	金属材料与零件加工 Metal Materials and Processing	2	32	28	4				2					
	20520302	土力学 B Soil Mechanics B	3	48	40	8	工程力学				3				
	20508400	工程地质学基础 B Basic Engineering Geology B	2.5	40	40		地质学基础				2.5				
	20520700	流体力学 Hydromechanics	2.5	40	36	4	工程力学					2.5			
	20711900	液压传动 Hydraulic Control	3	48	44	4	流体力学					3			
	20517100	岩体力学 B Rock Mass Mechanics B	2.5	40	40		工程力学					2.5			
	20520500	岩土钻掘工艺学 Geotechnical Drilling Engineering	3	48	40	8	液压传动						3		
	20520800	钻井液与工程浆液 Drilling Fluids and Engineering Fluids	3	48	40	8	流体力学						3		
	20517500	岩土工程勘察 Engineering Geologic Exploration	2	32	28	4	工程地质学基础					2			

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业主干课 Main Specialty Courses	20521500	岩土钻掘设备 Geotechnical Drilling and Digging Equipments	2.5	40	32	8	液压传动						2.5		
	20510901	基础工程学 A Foundation Engineering A	3.5	56	50	6	钻探工艺学						3.5		
	20527600	桩基检测 Pile Detection	1	16	4	12	基础工程学						1		
	20510700	基础工程施工技术 The Techniques of Construction in Foundation Engineering	2.5	40	32	8								2.5	
	20518400	新技术专题报告 Special Topics on New Technology	1	16	16										1
	小计 **Sum**		**40**	**640**	**546**	**94**		**0**	**0**	**2**	**5.5**	**16**	**13**	**2.5**	**1**
专业选修课 Specialty Elective Courses		具体见专业选修课列表	10	160											
合计 **Sub-total**			**147.5**	**2440**	**1892**	**196**		**22.5**	**23.5**	**23**	**18**	**22**	**13**	**2.5**	**1**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41919002	C 语言课程设计 B Course Design of C Language B	1.5	1.5 周				1.5							
	40724800	机械制图课程设计 Course Design of Mechanical Drawing	0.5	0.5 周					0.5						
	40115200	地质教学实习(北戴河) Geological Field Training (Beidaihe)	2	2 周			地质学基础		2						
	40724602	金工实习 B Practice of Metal Processing Technique B	2	2 周						2					
	40530800	工程地质教学实习(秭归) Engineering Geology Teaching Practice (Zigui)	2	2 周			工程地质学基础				2				
	40530900	地质工程教学实习 Geological Engineering Teaching Practice	3	3 周			工程地质学基础				3				
	41120901	测量教学实习 A Instructed Practice for Engineering Surveying A	1	1 周			基础工程					1			

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
实践环节 Practical Work	40531000	地质工程生产实习 Geological Engineering Production Practice	4	4 周			基础工程施工						4		
	40531102	基础工程课程设计 Course Design of Foundation Engineering	1	1 周									1		
	40531200	钻探工艺学课程设计 Course Design of Drilling Technology	2	2 周									2		
	40527100	毕业实习和设计/论文 Practice and Thesis for Graduation	15	15 周											15
	小计 **Sum**		**36**	**36** 周				**3.5**	**2.5**	**2**	**5**	**1**	**7**	**0**	**15**
创新创业自主学习 Autonomous Learning	ZZ35000S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 **Sum**		**6**												
总计 **Total**			**189.5**	**2440** ＋ **36** 周	**1892**	**196**		**26**	**26**	**25**	**23**	**23**	**20**	**2.5**	**16**
专业选修课 Specialty Elective Courses	20512302	结构力学 B Structural Mechanics B	3.5	56	50	6								3.5	
	20511200	建筑材料 Building Materials	2	32	26	6								2	
	20502200	边坡处治工程 Slide Slope Engineering	2	32	28	4								2	
	20506800	非开挖工程学 Trenchless Engineering	2	32	26	6							2		
	20512500	金刚石工具设计与制造 Design and Manufacture of Diamond Tools	2	32	26	6								2	
	20528200	水文水井与地热钻井 Hydrological Wells and Geothermal Drilling	2	32	28	4								2	
	20531300	检测技术 Detection Technology	2	32	28	4								2	
	20527900	工程项目管理 Engineering Management	2	32	32									2	

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。

地质工程(岩土钻掘方向)专业课程分类统计

Course Category Statistics of Geological Engineering (Rock & Soil Drilling & Tunnelling)

课程学分 / 统计	通识教育课 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	创新创业自主学习 Autonomous Learning	学时总计 Total Hours	学分总计 Total Credits
	必修 Compulsory	选修 Selective							
学时/学分 Hrs/Crs	616/33.5	192/12	832/52	640/40	160/10	36周/36	6	2456＋36周	189.5
学分所占比例 Proportion of Credits	24.01%		27.44%	21.1%	5.28%	19%	3.17%		100%

土木工程专业培养方案

专业名称与代码：土木工程 081001

专业培养目标：

本专业坚持以马克思主义、毛泽东思想、邓小平理论为指导，为土木工程行业培养基础扎实、知识面宽、能力强、素质高，获得土木工程师基本训练的土木工程技术人才。毕业生具有良好的人文科学素养，扎实的自然科学、地质学与土木工程专业基础；掌握土木工程专业知识和规范；了解土木工程学科的前沿问题、发展现状和趋势；具有较强的工程实践能力、社会适应能力、创新创业能力和终身学习能力。他们具备一定的国际视野和较好的团队协作意识。本专业毕业生懂得专业相关法律法规；认识工程对客观世界和社会的影响，能胜任一般土木工程项目的勘察、设计、施工、监理和管理工作，也可以从事投资与开发、金融与保险、社会服务等工作。

培养子目标 1：培养坚持以马克思主义、毛泽东思想、邓小平理论、三个代表及科学发展观为指导，遵纪守法、乐于奉献、德智体美劳与健康个性和谐统一、全面发展的社会主义事业合格建设者和可靠接班人。

培养子目标 2：在坚持“宽口径、厚基础、强素质、重应用”的前提下，立足国际化、信息化、一体化发展要求，着眼国内市场化、专业化、社会化的发展趋势，以土木工程理论为基础，具备学科交叉知识，培养系统掌握土木工程专业基本理论、基本方法和基本技术的创新创业人才。

培养子目标 3：具有综合运用土木工程专业知识解决复杂工程问题的综合能力、跨文化交流、竞争与合作的初步能力以及国际视野；具备土木工程新技术、新方法创新和开发的基本能力。

培养子目标 4：能在建筑工程、岩土工程、地下建筑、道路与桥梁工程等相关领域从事勘察、设计、施工、监理和管理等工作，并具有创新精神、实践能力和国际视野的复合型工程技术人才。

专业毕业要求：

（1）工程知识：能够将数学、自然科学、工程基础和专业知识用于解决土木工程中的复杂问题。

（2）问题分析：能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析土木工程专业中的复杂问题，以获得有效结论。

（3）设计/开发解决方案：能够针对土木工程中的复杂问题设计合适的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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：能够基于科学原理并采用科学方法对复杂的土木工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

（5）使用现代工具：能够针对土木工程中的复杂问题，开发、选择与使用恰当的检测设备、数值软件和先进的施工机械等现代工程工具和文献检索等信息技术工具，设计工程方案、工程实施过程中复杂问题的解决方案，并对其适应性及效果进行预测评估。

（6）工程与社会：能够基于土木工程相关背景知识进行合理分析，评价土木工程专业的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。

（7）环境和可持续发展：具有环境意识及社会担当责任感，设计的工程方案、工程实施过程中复杂问题的解决方案符合“环境友好、造福社会”这一工程要旨。

（8）职业规范：具有良好的敬业精神、职业道德、科学素养、社会责任感，熟悉行业技术标准、相关政策、法律和法规，能够在土木工程实践中理解并遵守行业的职业道德和行业规范，履行相关责任和义务。

（9）个人和团队：具有较强的环境适应能力和团队合作精神，能够在多学科、多文化背景下的团队中承担个体或负责人的角色。

（10）沟通：具有较强的语言、文字表达能力以及人文社会科学素养，能够就土木工程问题与业界同行及社会公众进行有效沟通和交流。并具备国际视野，能够在跨文化背景下进行沟通和交流。

（11）项目管理：具备基本的工程经济和工程管理知识，具有组织管理、统筹及整合资源的能力，能够在多学科、多文化环境中应用。

（12）终身学习：具有终生教育和继续学习的意识，面对本行业及相关领域技术、个人职业及社会和环境的各种变迁，具有较强的自我获取知识、信息收集能力，以及适应、处理能力，能及时了解相关领域最新理论、技术及学科前沿动态。

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：**能够将数学、自然科学、工程基础和专业知识用于解决土木工程中的复杂问题。	**①课堂教学：**开设高等数学、线性代数、概率论与数理统计、大学物理、工程力学 A1（理论力学）、工程力学 A2（材料力学）、结构力学、弹塑性力学、建筑制图、钢筋混凝土结构原理、钢结构、土力学、工程地质学、路基路面工程学、桥梁工程学等课程。 **②课外学习：**培养学生课外阅读兴趣，引导学生合理挑选相关图书文献资料，为学生开展专题讲座、学术报告等。

序号	毕 业 要 求	实现途径（教学过程）
2	**问题分析：**能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析土木工程专业中的复杂问题，以获得有效结论。	**①课堂教学：**地质学基础、土力学、岩体力学、钢筋混凝土结构原理、电工与电子技术、测量学实习、地质认识实习、专业认识实习、建筑制图课程设计。 **②课外学习：**鼓励学生多阅读与课堂教学内容相关的书籍文献，为学生安排相应的课程作业、大学生科研立项、学科前沿调研报告。
3	**设计/开发解决方案：**能够针对土木工程中的复杂问题设计合适的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。	**①课堂教学：**钢筋混凝土结构课程设计、钢结构课程设计、结构动力学、基础工程学课程设计、土木工程材料实验、地下建筑结构课程设计、地下建筑施工课程设计、岩土工程施工、岩土测试技术、房屋建筑学课程设计、道路勘测设计课程设计、路基路面工程课程设计、桥梁工程课程设计、桥梁施工、施工组织课程设计、毕业设计 **②课外学习：**鼓励学生广泛阅读钻探领域的专业书籍和期刊文章，课程作业、大学生科研立项、学科前沿调研报告
4	**研究：**能够基于科学原理并采用科学方法对复杂的土木工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。	**①课堂教学：**建筑结构试验、地下工程检测与监测技术、道桥结构实验、岩土工程监测 **②课外学习：**鼓励学生参加各种新技术专题报告，关注与本专业相关的网络信息，完成课程作业、大学生科研立项、学科竞赛、学科前沿调研报告。
5	**使用现代工具：**能够针对土木工程中的复杂问题，开发、选择与使用恰当的检测技术、数值模拟和先进的施工工艺等现代工程工具和文献检索等信息技术工具，设计工程方案、工程实施过程中复杂问题的解决方案，并对其适应性及效果进行	**①课堂教学：** C 语言程序设计、C 语言课程设计、物理实验、数值模拟技术与应用、土木工程 CAD、岩土工程专业讲座 **②课外学习：**鼓励学生参加各种学术报告和科研创新活动，关注与本专业相关的最近最新技术，熟悉常用的文献检索工具，积极利用校内相关实验室，培养学生动手实践能力。

序号	毕 业 要 求	实现途径（教学过程）
	预测评估。	
6	**工程与社会**:能够基于土木工程相关背景知识进行合理分析,评价土木工程专业的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。	**①课堂教学**：毛泽东思想与中国特色社会理论体系概论、中国近现代史纲要、体育、军事理论、通识教育选修课、军事训练、工程项目管理 、工程导论等课程。 **②课外学习**： 鼓励学生多参加工程相关领域专家、学者所做的工程案例报告，结合所学专业知识，进行工程案例分析、社会调查，综合考虑各方面因素，制定施工优化方案。
7	**环境和可持续发展**:具有环境意识及社会担当责任感，设计的工程方案、工程实施过程中复杂问题的解决方案符合“环境友好、造福社会”这一工程要旨。	**① 课堂教学**：工程导论、通识教育选修课、地基处理、土木工程材料、专业讲座、道路勘察设计、地下建筑结构、基础工程学、新技术专题报告、边坡处治工程 **② 课外学习**：工程作业、大学生科研立项、专题讲座等。
8	**职业规范**:具有良好的敬业精神、职业道德、科学素养、社会责任感,熟悉行业技术标准、相关政策、法律和法规,能够在土木工程实践中理解并遵守行业的职业道德和行业规范,履行相关责任和义务。	**①课堂教学**：马克思主义原理、思想道德修养与法律基础、工程导论、土木工程法规、通识教育选修课。 **②课外学习**：入学教育、大学生心理健康教育、形势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等
9	**个人和团队**:具有较强的环境适应能力和团队合作精神，能够在多学科、多文化背景下的团队中承担个体	**①课堂教学**：工程项目管理、通识教育选修课、地质认识实习、专业认识实习、生产实习、测量实习、毕业实习与设计。 **②课外学习**：入学教育、大学生心理健康教育、形

序号	毕 业 要 求	实现途径（教学过程）
	或负责人的角色。	势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等。 鼓励学生广泛阅读工程管理和经济决策的专业书籍文献，组织学生参加各种科技活动。
10	**沟通：**具有较强的语言、文字表达能力以及人文社会科学素养，能够就土木工程问题与业界同行及社会公众进行有效沟通和交流。并具备国际视野，能够在跨文化背景下进行沟通和交流。	**①课堂教学：**大学英语、通识教育选修课。 **②课外学习：**鼓励学生多去图书馆、多登录国内外各类电子期刊和图书服务网站。获得文献检索的能力，了解相关领域技术的最新研究成果，撰写学科前沿报告，参加科技论文报告会、学术讲座、撰写科技论文、参与教师科研项目等。
11	**项目管理：**具备基本的工程经济和工程管理知识，具有组织管理、统筹及整合资源的能力，能够在多学科、多文化环境中应用。	**①课堂教学：**思想道德修养与法律基础、工程导论、通识教育选修课、工程项目管理、工程招投标与概预算。 **②课外学习：**鼓励学生参与大学生科研立项、学科竞赛、学科前沿调研报告、教师科研项目等。
12	**终身学习：**具有终生教育和继续学习的意识，面对本行业及相关领域技术、个人职业及社会和环境的各种变迁，具有较强的自我获取知识、信息收集能力，以及适应、处理能力，能及时了解相关领域最新理论、技术及学科前沿动态。	**① 课堂教学：**通识教育选修课、社会调查 **② 课外学习：**数学建模竞赛、结构设计竞赛、学科竞赛、发明创造、科研报告、大学生科研立项等。

主干学科：土木工程、力学

核心课程：工程力学 A1（理论力学）、工程力学 A2（材料力学）、结构力学、弹塑性力学、土力学、岩体力学、工程地质学基础、基础工程学、土木工程材料、钢筋混凝土结构原理、钢筋混凝土结构及砌体结构设计、钢结构、房屋建筑学、地下建筑结构、地下建筑施工、岩土工程施工、建筑施工技术、桥梁施工、工程招投标与概预算、路基路面工程学、桥梁工程学等。

主要专业实验：材料力学实验、土木工程材料实验、结构实验、岩土测试实验等 。

主要实践性教学环节：包括测量实习、地质认识实习、专业认识实习、专业认识实习、生产实习、课程设计、毕业实习与设计等。

修业年限：四年。

授予学位：工学学士。

相近专业：工程力学，工程管理。

Program for Civil Engineering

Specialty and Code: Civil Engineering 081001

Educational Objective:

Guided by Marxism, Maoism, Deng Xiaoping Theory, this major cultivates creative students of a preliminary training to be civil engineers who have experienced a comprehensive enhancement in professional knowledge, practical capability and quality. Graduates would be featured by well humanities literacy, good understanding of the fundamentals of natural science, earth science and civil engineering. They master professional knowledge and specifications of civil engineering, and also know the current state, frontiers and hot topics of this major. They are expected to have a good command of ability in engineering practice, self-adjustment, creation, self-improvement and sense of teamwork. With reasonable study on related policies and laws, the graduates recognize the influence of project on nature and society, and thus are suitable to pursue careers in civil projects (investigation, design, construction and so on) as well as financial departments and social agencies.

The education objective can be divided into four sub-objectives as follows:

Sub-objective 1: Guided by Marxism, Maoism, Deng Xiaoping Theory, thought of Three Represents and Scientific Outlook on Development, this major aims to train students to become law-abiding, dedicated and qualified constructer and successor of socialist cause with comprehensive development of moral, intellectual, physical, aesthetic and labor education.

Sub-objective 2: Under the principles of “broad knowledge, solid foundation, top quality and applicability”, to meet the requirements of internationalization, informatization and integrative development, this major aims to train students with the principal theory, basic methods and skills of civil engineering based on geology theory and mechanics, and some interdisciplinary knowledge.

Sub-objective 3: Students are required to be able to figure out complex engineering problems with a comprehensive application of professional knowledge. They are also expected to possess international perspectives, ability of intercultural communication, competition and cooperation, and preliminary ability to develop and innovate technologies and methods in civil engineering.

Sub-objective 4: Graduates are capable of dealing with roles of investigation, design, construction, supervision in building projects, geotechnical engineering, underground projects as well as other fields in civil engineering. They are equipped by spirit of creation, ability of practice and international perspectives and become human resource of comprehensive knowledge.

Graduation Requirements:

1. **Engineering knowledge**: Students are required to be able to solve complex problems in civil engineering by applying knowledge from mathematics, natural science, engineering basis and profession.

2. **Problem analysis:** Students are expected to be able to identify, express and analyze complex geological engineering problems through literature research, and obtain valid conclusions using basic principles of applied mathematics, natural science and engineering technologies.

3. **Solution design/development**: Students are able to provide solutions for complex problems in civil engineering. They also can design a system, unit (component) or technic process for specific purposes. The design process embodies the sense of innovation with a consideration of factors including society, health, safety, law, culture and environment.

4. **Research**: Students are able to conduct researches on complex civil engineering problems by applying reasonable methodologies based on scientific principles. The research includes experiment design, data analysis and interpretation, and to draw reasonable conclusions through information integration.

5. **Modern tools application**: Students can develop or choose appropriate modern tools (testing techniques, numerical software and advanced equipment) and information technology tools (literature research) to figure out programs for complex problems in the design and construction processes of civil engineering. Assessment on the availability and effect can also be implemented.

6. **Engineering and society**: With application of the background knowledge, students are able to analyze the influence of project or program of civil engineering on society, health, safety, law and culture, and understand responsibilities they bear.

7. **Environment and sustainable development**: With a good sense of environment

protection and social responsibilities, project or program of civil engineering should be designed following the principle of being beneficial to environment and society.

8. **Career regulation**: Students should have professional ethics, devotion to job, social responsibilities. They should be familiar with related technical standards, policies and regulations. After that they can follow these regulations and implement their responsibilities and obligations in civil engineering practice.

9. **Individual and team work**: Students are trained to have the sense of self-adjustment and team work, so that they can play a role successfully in a team with a background of multi-subjects or multi-cultures.

10. **Communication**: Students are able to effectively communicate and exchange with industry peers and the public on complex civil engineering problems by a good command of speaking, writing and humanities literacy. Students should also have international perspectives, thus can exchange and communicate in cross-cultural settings.

11. **Project management**: Students are able to understand and master the engineering management principles and economic decision-making methods, ready to apply them in multi-discipline and multi-culture conditions.

12. **Self-improvement**: Students should have an initial consciousness to self-promoting and self-improvement. Confronted with a variation or update of job, environment and technology, they can adapt or deal with it promptly by acquiring new information, theory and methods from self-improvement plans.

Graduation requirements and ways to achieve:

No.	Graduation Requirements	Ways to Achieve (Teaching Procedures)
1	Engineering knowledge: Students are required to be able to solve complex problems in civil engineering by applying knowledge from mathematics, natural science, engineering basis and profession.	① Classroom Teaching: Advanced Mathematics, Linear Algebra B, Probability and Mathematics Statistics B, College Physics, Engineering Mechanics A1, Engineering Mechanics A2, Structure Mechanics B, Principle of Elastic and Plastic Mechanics, Building Engineering Graphics, Reinforced Concrete Structure, Steel Structure, Soil Mechanics, Engineering Geology, Roadbed and Pavement Engineering, Bridge Engineering. ② Out-of-class Learning: Develop student interesting in reading and guide them to find needed literature; Hold lectures on special topics, academic report, etc.
2	Problem analysis: Students are expected to be able to identify, express and analyze complex geological engineering problems through literature research, and obtain valid conclusions using basic principles of applied mathematics, natural science and engineering technologies.	① Classroom Teaching: Fundamentals of Geology, Soil Mechanics, Rock Mass Mechanics, Reinforced Concrete Structure, Electrician and Electron Technology, Surveying A, Surveying (practice), Primary Geological Field Training (Beidaihe), Engineering field Training, Course design of Architectural Drawing. ② Out-of-class Learning: To encourage students to read more literacy, participate in the mechanics competition and research programs; Arrange suitable homework; To cultivate mechanical thinking and practical ability.

No.	Graduation Requirements	Ways to Achieve (Teaching Procedures)
3	Solution design/development: Students are able to provide solutions for complex problems in civil engineering. They also can design a system, unit (component) or technic process for specific purposes. The design process embodies the sense of innovation with a consideration of factors including society, health, safety, law, culture and environment.	① Classroom Teaching: Course Design of Reinforced Concrete Structure, Course Design of Steel Structure, Structural Dynamics, Course Design of Foundation Engineering, Experiment of Civil Engineering Materials, Course Design of Underground Structures, Course Design of Underground Engineering Construction, Geotechnical Engineering Construction, Geotechnical Testing Technology, Architectural Design & Construction, Course Design of Road Survey And Design, Course Design of Roadbed and Pavement Engineering, Course Design of Bridge Engineering, Bridge Construction, Course Design for Construction Organization, Graduation Thesis. ② Out-of-class Learning: To encourage students to read more literacy, participate in the mechanics competition and research programs; To catch the hot topics of subjects by investigation.
4	Research: Students are able to conduct researches on complex civil engineering problems by applying reasonable methodologies based on scientific principles. The research includes experiment design, data analysis and interpretation, and to draw reasonable conclusions through information integration.	① Classroom Teaching: Structure Experiment, Monitoring and Testing of Underground Engineering, Structure of Road and Bridge, Monitoring of Geotechnical Engineering. ② Out-of-class Learning: To encourage students to read more literacy, participate in the mechanics competition and research programs; To conduct survey about the frontier of subject, and join in research programs of professors'.

No.	Graduation Requirements	Ways to Achieve (Teaching Procedures)
5	Modern tools application: Students can develop or choose appropriate modern tools (testing techniques, numerical software and advanced equipment) and information technology tools (literature research) to figure out programs for complex problems in the design and construction processes of civil engineering. Assessment on the availability and effect can also be implemented.	① Classroom Teaching: C Languages Programming B, Course Design for C Language B, Physical Experiment, Numerical Simulation Technology And Application, Civil Engineering CAD, Geotechnical Lecture. ② Out-of-class Learning: To encourage students join in all kinds of scientific reports and research activities, study the application of tools for literature search, cultivate their ability of practice by take advantage of laboratory.
6	Engineering and society: With application of the background knowledge, students are able to analyze the influence of project or program of civil engineering on society, health, safety, law and culture, and understand responsibilities they bear.	① Classroom Teaching: Introduction to Mao Tse-tung Thought and the Theoretical System of Socialism with Chinese Characteristics, The Essentials of Modern Chinese History, Physical Education, Military Theory, Introduction to Civil Engineering, Liberal Education Courses, Military training, Social Investigation ② Out-of-class Learning: To encourage students join in all kinds of scientific reports and research activities, finish course homework, prompt Student Research Training Plan.
7	Environment and sustainable development: With a good sense of environment protection and social responsibilities, project or program of civil engineering should be	① Classroom Teaching: Introduction to Engineering, Liberal Education Courses, Foundation Engineering A, Materials of Civil Engineering, Foundation Treatment, Construction Material, Lecture on Engineering

No.	Graduation Requirements	Ways to Achieve (Teaching Procedures)
	designed following the principle of being beneficial to environment and society.	Geology, Road Survey and Design, Underground Construction Structure, Special Topics on New Technology, Slide slope Engineering ② Out-of-class Learning: Course homework, Student Research Training Plan, Lectures on special topics, etc.
8	Professional standard: Students should have professional ethics, devotion to job, social responsibilities. They should be familiar with related technical standards, policies and regulations. After that they can follow these regulations and implement their responsibilities and obligations in civil engineering practice.	① Classroom Teaching: Principles of Marxism, Morality Education Fundamentals of Law, Introduction to Engineering, Introduction to Civil Engineering, Liberal Education Courses ② Out-of-class Learning: Entrance Education, Student Psychologically Healthy Education, Policy and Situation Education, Guide for Career, Education for Graduation, Special Lectures by Class Leader and Counselor, Academic Lecture, etc.
9	Individual and team work: Students are trained to have the sense of self-adjustment and team work, so that they can play a role successfully in a team with a background of multi-subjects or multi-cultures.	① Classroom Teaching: Liberal Education Courses, Primary Geological Field Training (Beidaihe), Geology Field Training (Zhoukoudian), Professional Teaching Practice (Zigui), Practice for Graduation, Geological Engineering teaching practice, Geological Engineering production practice ② Out-of-class Learning: Course homework, Student Research Training Plan, etc.

No.	Graduation Requirements	Ways to Achieve (Teaching Procedures)
10	Communication: Students are able to effectively communicate and exchange with industry peers and the public on complex civil engineering problems by a good command of speaking, writing and humanities literacy. Students should also have international perspectives, thus can exchange and communicate in cross-cultural settings.	① Classroom Teaching: College English, Liberal Education Courses, Lecture on Engineering Geology ② Out-of-class Learning: To encourage students read more literacy, join in Survey report of academic Foreland, listen more academic lectures, take part in competition of scientific study, join in scientific research projects, etc.
11	Project management: Students are able to understand and master the engineering management principles and economic decision-making methods, ready to apply them in multi-discipline and multi-culture conditions.	① Classroom Teaching: Morality Education Fundamentals of Law, Introduction to Engineering, Liberal Education Courses, Introduction to Civil Engineering, Engineering Bid and Budget, Engineering management. ② Out-of-class Learning: To encourage students join in Survey report of academic Foreland, join in research projects of supervisors', etc.
12	Self-improvement: Students should have an initial consciousness to self-promoting and self-improvement. Confronted with a variation or update of job, environment and technology, they can adapt or deal with it promptly by acquiring new information, theory and methods from self-improvement plans.	① Classroom Teaching: Liberal Education Courses, Course Design for Engineering Geology Survey, Social Investigation, Practice for Graduate and Bachelor Thesis ② Out-of-class Learning: Join in mathematic modelling competition, competition of structure design; to guide them to invent and apply for patent, to lead them to finish research program under supervision of professors.

Major Disciplines: Civil Engineering, Mechanics

Main Courses: Engineering Mechanics A1 (Theoretical Mechanics), Engineering Mechanics A2 (Material Mechanics), Structure Mechanics, Elastic and Plastic Mechanics, Soil Mechanics, Rock Body Mechanics, Fundamental of Engineering Geology, Foundation Engineering, Construction Material, Principle of Reinforced Concrete Structure, Reinforced Concrete Structure and Masonry Structure Design, Steel Structure, Architectural Design and Construction, Underground Construction Structure, Underground Engineering Construction, Geotechnical Engineering Construction, Construction Technology, Bridge Construction, Engineering Bid and Budget, Roadbed and Pavement Engineering, Bridge Engineering.

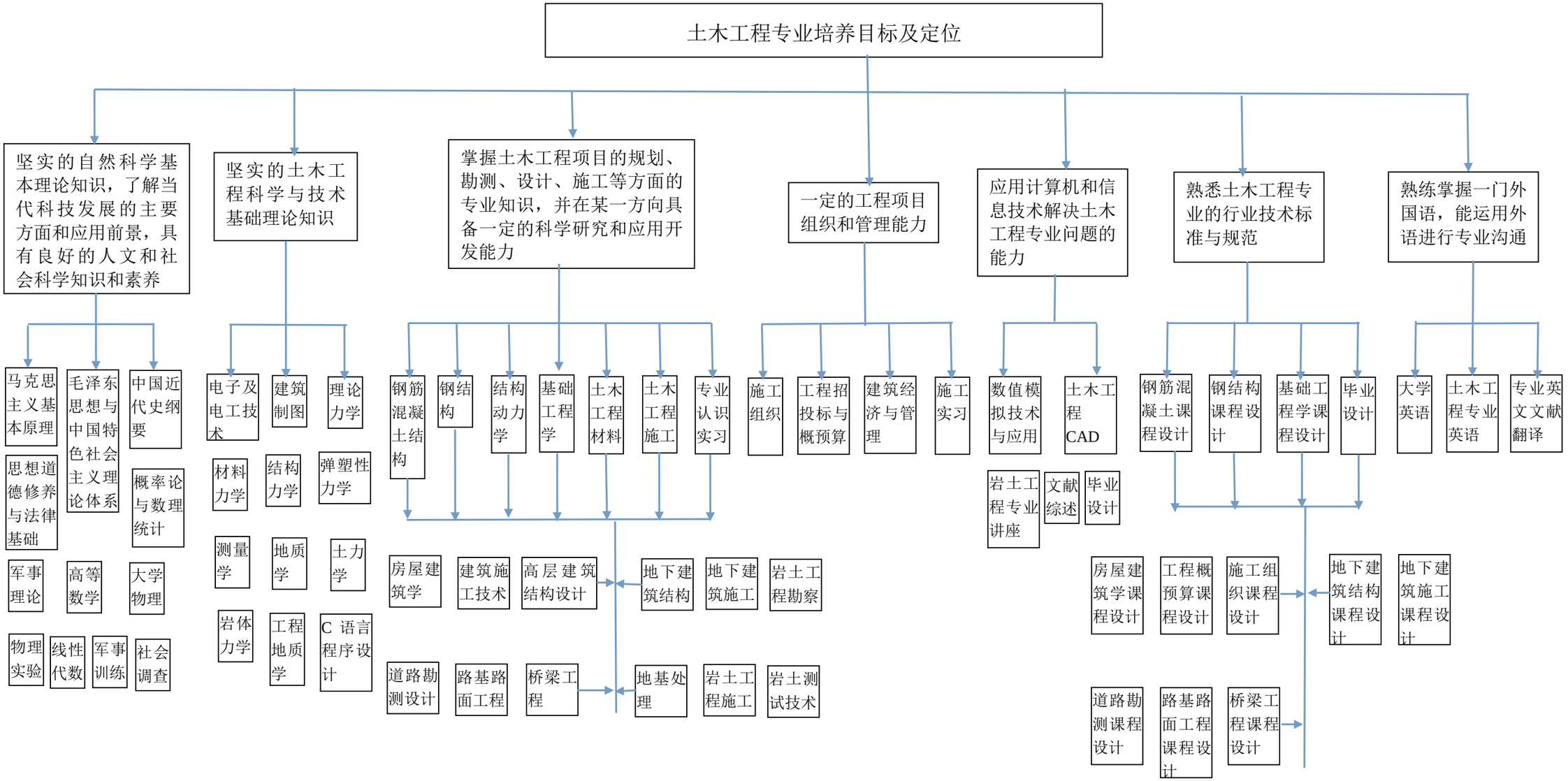
Lab Experiments: Material Mechanics Experiment, Experiment of Construction Materials, Structural Experiment, Geotechnical Test Experiment.

Practical Work: Instructive Practice for Surveying, Primary Field Training, Practice of Specialty Understanding, Instructive Practice for Major, Productive Practice, Course Design, Practice for Graduate and Bachelor Thesis.

Duration: Four years.

Degree Granted: Bachelor of Engineering

Related Specialties: Engineering Mechanics, Engineering Management


土木工程专业培养目标及定位
坚实的自然科学基本理论知识，了解当代科技发展的主要方面和应用前景，具有良好的人文和社会科学知识和素养
坚实的土木工程科学与技术基础理论知识
掌握土木工程项目的规划、勘测、设计、施工等方面的专业知识，并在某一方向具备一定的科学研究和应用开发能力
一定的工程项目组织和管理能力
应用计算机和信息技术解决土木工程专业问题的能力
熟悉土木工程专业的行业技术标准与规范
熟练掌握一门外国语，能运用外语进行专业沟通
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
中国近代史纲要
思想道德修养与法律基础
概率论与数理统计
军事理论
高等数学
大学物理
物理实验
线性代数
军事训练
社会调查
电子及电工技术
建筑制图
理论力学
材料力学
结构力学
弹塑性力学
测量学
地质学
土力学
岩体力学
工程地质学
C 语言程序设计
钢筋混凝土结构
钢结构
结构动力学
基础工程学
土木工程材料
土木工程施工
专业认识实习
房屋建筑学
建筑施工技术
高层建筑结构设计
地下建筑结构
地下建筑施工
岩土工程勘察
道路勘测设计
路基路面工程
桥梁工程
地基处理
岩土工程施工
岩土测试技术
施工组织
工程招投标与概预算
建筑经济与管理
施工实习
数值模拟技术与应用
土木工程CAD
岩土工程专业讲座
文献综述
毕业设计
钢筋混凝土课程设计
钢结构课程设计
基础工程学课程设计
毕业设计
房屋建筑学课程设计
工程概预算课程设计
施工组织课程设计
地下建筑结构课程设计
地下建筑施工课程设计
道路勘测课程设计
路基路面工程课程设计
桥梁工程课程设计
大学英语
土木工程专业英语
专业英文文献翻译

土木工程（岩土工程方向）专业课程教学计划表（卓越工程师计划）

Course Descriptions of Civil engineering (Geotechnical Engineering Direction)

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32						2				
		120001*0	思想道德修养与法律基础 Morality Education 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 C Languages Programming B	2.5	40	28	12		2.5							
		20520200	工程导论 Introduction to Civil Engineering	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**	**604**	**12**		**11**	**8.5**	**8**	**6**	**0**	**0**	**0**	**0**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
学科基础课 Disciplinary Fundamental Courses	212127*2	高等数学 B Advanced Mathematics B	10	160	160			4	6						
	212130*3	大学物理 C College Physics C	6	96	96				3.5	2.5					
	212132*1	物理实验 A Physics Experiment A	3.5	56		56			2	1.5					
	21212801	线性代数 A Linear Algebra A	3.5	56	56					3.5					
	21213501	概率论与数理统计 A Probability and Mathematics Statistics A	3.5	56	56						3.5				
	20302403	大学化学 C College Chemistry C	4	64	50	14			4						
	20714600	建筑制图 Building Engineering Graphics	3.5	56	46	10		3.5							
	20508011	工程力学 A1（理论力学） Engineering Mechanics A1	5	80	76	4				5					
	20508021	工程力学 A2（材料力学） Engineering Mechanics A2	4.5	72	62	10					4.5				
	21120801	测量学 A Surveying A	2.5	40	40				2.5						
	20115000	地质学基础 Fundamentals of Geology	4.5	72	62	10		4.5							
	小计 Sum		**50.5**	**808**	**704**	**104**		**14.5**	**15.5**	**12.5**	**8**	**0**	**0**	**0**	**0**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业主干课 Main Specialty Courses	20511200	建筑材料 Construction Materials	2	32	26	6					2				
	20530301	土力学 A Soil Mechanics	4	64	52	12						4			
	20520400	岩体力学 A Rock Mass Mechanics A	3	48	40	8						3			
	20513202	结构力学 B Structural MechanicsB	3.5	56	48	8						3.5			
	20504200	弹塑性力学基础 Principle of Elastic and Plastic Mechanics	3.5	56	52	4						3.5			
	20508400	工程地质学基础 B Principle of Engineering Geology B	2.5	40	40							2.5			
	20517500	岩土工程勘察 Geotechnical Engineering Investigation	2.5	40	40							2.5			
	20507301	钢筋混凝土结构原理 A Reinforced Concrete StructureA	3.5	56	48	8							3.5		
	20510901	基础工程学 A Foundation Engineering A	3.5	56	56								3.5		
	20526000	岩土工程施工 Construction in Geotechnical Engineering	2.5	40	40								2.5		
	20504602	地基处理 B Foundation Treatment B	2	32	32								2		
	小计 Sum		**32.5**	**520**	**474**	**46**		**0**	**0**	**0**	**2**	**19**	**11.5**	**0**	**0**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业选修课 Specialty Elective Courses		具体见专业选修课列表	10	160											
合计 Sub-total			**138.5**	**2296**	**1782**	**162**		**25.5**	**24**	**20.5**	**16**	**19**	**11.5**	**0**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2周				2							
	41919002	C 语言程序设计 C Language Programming	1.5	1.5周				1.5							
	40503000	测量教学实习 A Instructive Practice for Engineering Surveying A	1	1周					1						
	40531101	基础工程学课程设计 A Course Design for Foundation Engineering A	2	2周									2		
	40531500	地基处理课程设计 Course Design for Foundation treatment	1	1周									1		
	40531600	钢筋混凝土结构原理课程设计 Course Design for Reinforced Concrete Structure	1.5	1.5周									1.5		
	40529300	岩土工程勘察课程设计 Course Design for Geotechnical Engineering Investigation	1	1周								1			
	40115200	地质认识实习（北戴河） Primary Geological Field Training (Beidaihe)	2	2周					2						

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	40531700	专业教学实习（秭归） Professional Field Training (Zigui)	4	4 周							4				
	40526400	专业实习（武汉） Professional Field Training (Wuhan)	3	3 周									3		
	40531800	岩土工程勘察实践（企业实习） Practice of Geotechnical Engineering Investigation	3	3 周										3	
	40531900	岩土工程勘察实践报告 Practice Report of Geotechnical Engineering Investigation	1	1 周										1	
	40532000	岩土工程设计实践（企业实习） Practice of Geotechnical Engineering Design	4	4 周										4	
	40532100	岩土工程设计实践报告 Practice Report of Geotechnical Engineering Design	2	2 周										2	
	40501700	毕业实习 Practice for Graduation	8	8 周											8
	40529600	毕业设计 Graduation Thesis	8	8 周											8
	小计 Sum		**45**	**45 周**				**3.5**	**3**	**0**	**4**	**1**	**7.5**	**10**	**16**
创新创业自主学习 Autonomous Study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention Innovation & Research Presentation)	4												

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	小计 Sum		6												
总计 Total			189.5	2296+45周	1782	162		30	26	20.5	20	20	19	10	16
可开出专业选修课列表 Specialty Elective Courses	20104002	构造地质学 B Structural Geology B	3	48	36	12				3					
	20113100	矿物岩石学 A Mineralogy and Petrology A	3	48	12	36			3						
	20103800	第四纪地质与地貌学 Quaternary Geology and Geomorphology	2	32	32						2				
	20409102	水文地质学基础 B Principle of Hydrogeology B	2.5	40	32	8						2.5			
	20400802	地下水动力学 B Dynamics of Groundwater B	2.5	40	34	6							2.5		
	20520700	流体力学 Foundation of Fluid Mechanics	2.5	40	36	4						2.5			
	20506000	地质灾害防治 Geological Hazard Control	2	32	32								2		
	20517200	岩土测试技术 Geotechnique Tests	2	32	32								2		
	20536600	岩土工程专业讲座 Lecture on Geotechnical Engineering	2	32	32								2		

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20515400	水利水电工程地质 Engineering Geology for Hydraulic Project	2	32	32								2		
	20516200	土木工程概论 Introduction to Civil Engineering	2	32	32						2				

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。

土木工程（岩土工程方向）专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	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	808/50.5	520/32.5	160/10	45 周/45	6	2296+45 周	189.5
学分所占比例	24.01%		26.65%	17.15%	5.28%	23.75%	3.17%		100%

土木工程（建筑工程方向）专业课程教学计划表

Course Descriptions of Civil Engineering（Building Construction Engineering Direction）

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32						2				
		12000210	思想道德修养与法律基础 Morality Education and Fundamentals of Law	3	48	48			1.5	1.5						
		11307610	体育 Physical Education	4	144	144			1	1	1	1				
		10911610	大学英语 College English	12	192	192			3	3	3	3				
		11918902	C 语言程序设计 B C Language Programming B	2.5	40	28	12				2.5					
		20520200	工程导论 Introduction to Civil Engineering	1	16	16			1							
		44300200	军事训练 Military Theory	2	32	32			2							
	选修 Elective	总计 12 学分，含创新创业选修课学分，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**	**604**	**12**		**8.5**	**8.5**	**10.5**	**6**	**0**	**0**	**0**	**0**
Disciplinary Fundamental Courses	学科基础课	21212712	高等数学 B Advanced Mathematics B	10	160	160			4	6						
		21213013	大学物理 C College Physics C	6.0	96	96				3.5	2.5					
		21213211	物理实验 A Physical ExperimentsA	3.5	56		56			2	1.5					

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	21212802	线性代数 B Linear Algebra B	2.5	40	40					2.5					
	21213501	概率论与数理统计统计 A Probability and Statistics A	3.5	56	56					3.5					
	20714600	建筑制图 Architectural Drawing	3.5	56	48	8		3.5							
	20508011	工程力学 A1（理论力学） Engineering Mechanics A1	5.0	80	80					5					
	20508021	工程力学 A2（材料力学） Engineering Mechanics A2	4.5	72	60	12					4.5				
	20702503	电工及电子技术 B Electrician and Electron Technology B	4	64	54	10					4				
	21120801	测量学 A Surveying A	2.5	40	40				2.5						
	20512301	结构力学 A Structural Mechanics A	5.5	88	70	18						5.5			
	小计 Sum		**50.5**	**808**	**704**	**104**		**7.5**	**14**	**15**	**8.5**	**5.5**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20506501	房屋建筑学 A Building Architecture A	3	48	48						3.0				
	20523200	土木工程材料 Civil Engineering Material	2.5	40	32	8					2.5				
	20516400	土木工程机械 Civil Engineering Machinery	3	48	44	4						3			
	20507301	钢筋混凝土结构原理 A Reinforced Concrete Structure A	3.5	56	56							3.5			

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20520302	土力学 B Soil Mechanics B	3	48	34	14						3			
	20508400	工程地质学基础 B Principles of Engineering Geology B	2.5	40	40							2.5			
	20506900	钢结构 Steel Structure	3.0	48	48								3		
	20510902	基础工程学 B Foundation Engineering B	2.5	40	40								2.5		
	20507000	钢筋混凝土结构及砌体结构设计 Reinforced Concrete and Masonry Structure Design	3	48	48								3		
	20523300	建筑施工技术 Construction Technology	3.5	56	56								3.5		
	20509500	工程招标投标与概预算 Engineering Bidding and Budget	2	32	32								2		
	20523400	建筑结构抗震 Anti-Earthquake Design of Structure	2.5	40	40									2.5	
	20523500	高层建筑结构设计 Structure Design of High Building	2.5	40	40									2.5	
	20514400	施工组织 Construction Organization	1.5	24	24									1.5	
	小计 Sum		**38**	**608**	**582**	**26**		**0**	**0**	**0**	**5.5**	**12**	**14**	**6.5**	**0**
专业选修课 Specialty Elective Courses		具体见专业选修课列表	14	224											

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Sub-total			**148**	**2448**	**1890**	**142**		**18.5**	**20**	**25.5**	**20**	**17.5**	**14**	**6.5**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	40503000	测量教学实习 Instructive Practice for Surveying	1	1 周					1						
	41919002	C 语言课程设计 B Course Design for C Language B	1.5	1.5 周							1.5				
	40531400	专业教学实习 Instructive Practice for major	3	3 周							3				
	40532300	房屋建筑学课程设计 Course Design for Building Architecture	1	1 周							1				
	40532410	钢筋混凝土结构课程设计 （一） Course Design for Reinforced Concrete(I)	1	1 周								1			
	40532420	钢筋混凝土结构课程设计 （二） Course Design for Reinforced Concrete (II)	1	1 周									1		
	40526600	生产实习 Construction Practice	6	6 周									6		
	40532500	钢结构课程设计 Course Design for Steel Structure	1	1 周									1		
	40511502	基础工程学课程设计 B Course Design for Foundation Engineering B	1	1 周									1		
	40532600	工程概预算课程设计 Course Design for Engineering Budget	1	1 周										1	
	40532700	施工组织课程设计 Course Design for Construction Organization	1	1 周										1	
	40502200	毕业实习和设计 Practice for Graduate and Bachelor Thesis	16	16 周											16
	小计 Sum		**36.5**	**36.5 周**				**3**	**0**	**0**	**5.5**	**1**	**9**	**2**	**16**
自主学习 Autonomous Study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	4												

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	小计 Sum		6	96											
总计 Total			190.5	2544 +36.5 周	2114	142		20.5	21	25.5	25.5	18.5	23	8.5	16
可开出专业选修课列表 Specialty Elective Courses	20513200	流体力学 Fluid Mechanics	2.5	40	36	4					2.5				
	20512200	结构动力学 Structure Dynamics	2.0	32	30	2							2		
	20504200	弹塑性力学基础 Elastic and Plastic Mechanics	3.5	56	52	4						3.5			
	20516000	土木工程法规 Civil Engineering Regulation	1	16	16						1				
	20507700	高层建筑施工 High Building Construction	2	32	32									2	
	20515500	特种结构 Special Structure	2	32	32									2	
	20807600	建筑经济与管理 Construction Economics and Management	2.0	32	32									2.0	
	20516600	土木工程专业英语 Professional English	2.5	40	40									2.5	
	20511700	建筑结构 CAD Architecture Structure CAD	2	32	16	16								2	
	20511900	建筑结构试验 Structure Experiment	2	32	12	20								2	
	20516500	数值模拟技术与应用 Numerical Simulation and Application in Civil Engineering	1.5	24	16	8								1.5	

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20103502	地质学基础 B Fundamentals of Geology B	4.5	72	62	10			4.5						
	20517500	岩土工程勘察 Geotechnical Engineering Prospecting	2.5	40	40								2.5		
	20529800	城市地下空间规划及利用 Urban Underground Space Planning and Utilization	2.0	32	24	8						2.0			

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。

土木工程（建筑工程方向）专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	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	808/50.5	608/38	224/14	36.5 周 /36.5	96/6	2544+36.5 周	190.5
学分所占比例	23.88%		26.51%	19.95%	7.35%	19.16%	3.15%		100%

土木工程（地下建筑工程方向）专业课程教学计划表

Course Descriptions of Civil Engineering（Underground Construction Engineering Direction）

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32						2				
		120002*0	思想道德修养与法律基础 Morality Education 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 C Language Programming B	2.5	40	28	12				2.5					
		20520200	工程导论 Introduction to Civil Engineering	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**	**604**	**12**		**8.5**	**8.5**	**10.5**	**6**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental		212127*2	高等数学 B Advanced Mathematics B	10	160	160			4	6						
		212130*3	大学物理 C College Physics C	6	96	96				3.5	2.5					
		212132*1	物理实验 A Physical Experiments A	3.5	56		56			2	1.5					
		21212802	线性代数 B Linear Algebra B	2.5	40	40					2.5					

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	21213501	概率论与数理统计 A Probability and Mathematics Statistics A	3.5	56	56					3.5					
	20714600	建筑制图 Architectural Drawing	3.5	56	48	8		3.5							
	20508011	工程力学（理论力学）A1 Theoretical Mechanics	5	80	80					5					
	20508021	工程力学（材料力学）A2 Material Mechanics	4.5	72	60	12					4.5				
	20725102	电工及电子技术 B Electrician and Electron Technology C	4	64	54	10					4				
	21120801	测量学 A SurveyingA	2.5	40	40				2.5						
	20115000	地质学基础 Fundamentals of Geology	4.5	72	62	10			4.5						
	小计 Sum		**49.5**	**792**	**696**	**96**		**7.5**	**18.5**	**15**	**8.5**	**0**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20523200	土木工程材料 Construction Materials	2.5	40	32	8					2.5				
	20520302	土力学 B Soil Mechanics B	3	48	34	14						3			
	20517100	岩体力学 B Rock Mass Mechanics B	2.5	40	32	8						2.5			
	20508400	工程地质学基础 B Principles of Engineering Geology B	2.5	40	40							2.5			
	20512301	结构力学 A Structural Mechanics A	5.5	88	70	18						5.5			
	20507301	钢筋混凝土结构原理 A Reinforced Concrete Structure A	3.5	56	56							3.5			
	20504200	弹塑性力学基础 Elastic and Plastic Mechanics	3.5	56	52	4						3.5			
	20510902	基础工程学 B Foundation Engineering B	2.5	40	40								2.5		
	20517500	岩土工程勘察 Geotechnical Engineering Prospecting	2.5	40	40								2.5		
	20521700	地下建筑结构 Underground Construction Structure	3.0	48	42	6							3.0		
	20521800	凿岩爆破 Rock Drilling and Blasting	3.0	48	40	8							3.0		
	20522300	地下建筑工程施工 Underground Engineering Construction	3.0	48	42	6							3.0		

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20516400	土木工程机械 Civil Engineering Machinery	3.0	48	44	4								3.0	
	小计 Sum		**40**	**640**	**564**	**76**		**0**	**0**	**0**	**2.5**	**20.5**	**14**	**3**	**0**
专业选修课 Specialty Elective Courses		具体见专业选修课列表	14	224											
合计 Sub-total			**149**	**2464**	**1864**	**184**		**18.5**	**24.5**	**25.5**	**17**	**20.5**	**14**	**3**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	40503000	测量教学实习 Instructive Practice for Surveying	1	1 周					1						
	40115200	地质认识实习（北戴河） Primary Field Training (Beidaihe)	2	2 周					2						
	11918902	C 语言课程设计 B Course Design for C Language B	1.5	1.5 周							1.5				
	40526300	专业教学实习（三峡） Instructive Practice for major (Sanxia)	3	3 周							3				
	40533000	钢筋混凝土课程设计 Course Design for Reinforced Concrete Structures	1	1 周								1			
	40526600	生产实习 Productive Practice for Road and Bridge Construction	6	6 周									6		
	40532800	地下建筑结构课程设计 Course Design for Underground Construction Structure	1	1 周									1		
	40532900	地下建筑工程施工课程设计 Course Design for Underground Engineering Construction	2	2 周									2		
	40532200	毕业实习和设计 Practice for Graduate and Bachelor Thesis	16	16 周											16
	小计 Sum		**35.5**	**35.5 周**				**2**	**3**	**0**	**4.5**	**1**	**9**	**0**	**16**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
创新创业自主学习 Autonomous Study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 Sum		**6**	**96**											
总计 Total			**190.5**	**2560 +35.5 周**	**1864**	**184**		**21.5**	**26.5**	**25.5**	**21.5**	**21.5**	**23**	**3**	**16**
可开出专业选修课列表 Specialty Elective Courses	20516600	土木工程专业英语 Professional English	2.5	40	40									2.5	
	20520700	流体力学 Fluid Mechanics	2.5	40	36	4					2.5				
	20516500	数值模拟技术与应用 Numerical Simulation and Application in Civil Engineering	1.5	24	16	8								1.5	
	20512200	结构动力学 Structural Dynamics	2.0	32	30	2							2		
	20516000	土木工程法规 Civil Engineering Regulation	1	16	16						1				
	205118020	建筑经济与管理 Construction Economics and Management	2.0	32	32									2.0	
	20529800	城市地下空间规划及利用 Urban Underground Space Planning and Utilization	2.0	32	24	8						2.0			
	20536700	土木工程 CAD	1.5	24		24								1.5	
	20522900	路基路面工程 Roadbed and Pavement Engineering	3.5	56	56								3.5		
	20523000	桥梁工程学 Bridge Engineering	3.5	56	56								3.5		
	20509500	工程招标投标与概预算 Engineering Bidding and Budget	2	32	32								2		
	20511800	建筑结构抗震 Anti-Earthquake Design of Structure	2.5	40	40									2.5	
	20507600	高层建筑结构 Structural Design of High Building	2.5	40	40									2.5	
	20506501	房屋建筑学 A House Architecture A	3	48	48						3.0				
	20523300	建筑施工技术 Construction Technology	3.5	56	56								3.5		

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。

土木工程（地下建筑工程方向）专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	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	792/49.5	640/40	224/14	35.5 周 /35.5	96/6	2560+35.5 周	190.5
学分所占比例	23.88%		25.98%	21.00%	7.35%	18.64%	3.15%		100%

土木工程（道路桥梁工程方向）专业课程教学计划表

Course Descriptions of Civil Engineering （Road and Bridge Engineering Direction）

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32						2				
		120002*0	思想道德修养与法律基础 Morality Education 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 C Language Programming B	2.5	40	28	12				2.5					
		20520200	工程导论 Introduction to Civil Engineering	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**	**604**	**12**		**8.5**	**8.5**	**10.5**	**6**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127*2	高等数学 B Advanced Mathematics B	10	160	160			4	6						
		212130*3	大学物理 C College Physics C	6	96	96				3.5	2.5					
		212132*1	物理实验 A Physical Experiments A	3.5	56		56			2	1.5					
		21212802	线性代数 B Linear Algebra B	2.5	40	40					2.5					
		21213501	概率统与数理统计计 A Probability and Statistics A	3.5	56	56					3.5					
		20714600	建筑制图 Architectural Drawing	3.5	56	48	8		3.5							
		20508011	工程力学（理论力学）A1 Theoretical Mechanics	5	80	80					5					
		20508021	工程力学（材料力学）A2 Material Mechanics	4.5	72	60	12					4.5				
		21120801	测量学 A Surveying A	2.5	40	40				2.5						

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20115000	地质学基础 Fundamentals of Geology	4.5	72	62	10			4.5						
	小计 Sum		**45.5**	**728**	**642**	**86**		**7.5**	**18.5**	**15**	**4.5**	**0**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20523200	土木工程材料 Construction Material	2.5	40	32	8					2.5				
	20520302	土力学 B Soil Mechanics B	3	48	34	14	理论力学 材料力学					3			
	20517100	岩体力学 B Rock Mass Mechanics B	2.5	40	32	8	理论力学 材料力学					2.5			
	20508400	工程地质学基础 B Principles of Engineering Geology B	2.5	40	40		地质学基础					2.5			
	20512301	结构力学 A Structural Mechanics A	5.5	88	70	18	理论力学 材料力学					5.5			
	20507301	钢筋混凝土结构原理 A Reinforced Concrete Structure A	3.5	56	56		结构力学					3.5			
	20522400	预应力结构设计原理 Principle of Pre-stressed Structure Design	2	32	32		钢混结构原理						2		
	20510902	基础工程学 B Foundation Engineering B	2.5	40	40								2.5		
	20504500	道路勘测设计 Road Survey and Design	2.5	40	40								2.5		
	20522900	路基路面工程 Roadbed and Pavement Engineering	3.5	56	56								3.5		
	20523000	桥梁工程学 Bridge Engineering	3.5	56	56		结构力学						3.5		
	20533400	桥梁施工 Bridge Construction	1.5	24	24		桥梁工程学							1.5	
	20506900	钢结构 Steel Structure	3.0	48	48								3.0		
	小计 Sum		**38**	**608**	**560**	**48**		**0**	**0**	**0**	**2.5**	**17**	**17**	**1.5**	**0**
专业选修课 Specialty Elective Courses		具体见专业选修课列表	18	288											
合计 Sub-total			**147**	**2432**	**1806**	**146**		**16**	**27**	**25.5**	**13**	**17**	**17**	**1.5**	**0**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41919002	C 语言课程设计 Course Design for C Language	1.5	1.5 周							1.5				
	41120901	测量教学实习 A Instructive Practice for Surveying A	1	1 周					1						
	40115200	地质认识实习（北戴河） Primary Field Training	2	2 周					2						
	40526300	专业教学实习（三峡） Instructive Practice for major (sanxia)	3	3 周							3				
	40533000	钢筋混凝土课程设计 Course Design for Reinforced Concrete Structures	1	1 周								1			
	40526600	生产实习 Productive Practice for Road and Bridge Construction	6	6 周									6		
	40533100	道路勘测课程设计 Course Design for Road Survey	1	1 周									1		
	40533200	桥梁工程学课程设计 Course Design for Bridge Engineering	1.5	1.5 周										1.5	
	40532500	钢结构课程设计 Course Design for Steel Structure	1	1 周										1	
	40533300	路基路面工程课程设计 Course Design for Roadbed and Pavement	1	1 周										1	
	40532200	毕业实习和设计 Practice for Graduate and Bachelor Thesis	16	16 周											16
	小计 Sum		**37**	**37 周**				**2**	**3**	**0**	**4.5**	**1**	**7**	**3.5**	**16**
创新创业自主学习 Autonomous Study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 Sum		**6**												
总计 Total			**190**	**2432 +37 周**	**1806**	**146**		**18**	**30**	**25.5**	**17.5**	**18**	**24**	**5**	**16**
Spec. 专业	20522600	道桥结构实验 Structure Experiment of road and bridge	1	16		16								1	

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20516600	土木工程专业英语 Professional English	2.5	40	40									2.5	
	20504200	弹塑性力学基础 Elastic and Plastic Mechanics	3.5	56	52	4						3.5			
	20520700	流体力学 Fluid Mechanics	2.5	40	36	4					2.5				
	20512200	结构动力学 Structural Dynamics	2	32	30	2							2		
	20516500	数值模拟技术与应用 Numerical Simulation and Application in Civil Engineering	1.5	24	16	8								1.5	
	20522700	道路 CAD Road CAD	1.5	24		24								1.5	
	20522800	桥梁设计软件应用 Application of Bridge Design Software	1.5	24		24								1.5	
	20516000	土木工程法规 Civil Engineering Regulation	1	16	16						1				
	20516400	土木工程机械 Civil Engineering Machinery	3	48	44	4								3	
	20509500	工程招标投标与概预算 Engineering Bidding and Budget	2	32	32								2		
	20517500	岩土工程勘察 Geotechnical Engineering Prospecting	2.5	40	40								2.5		
	20521700	地下建筑结构 Underground Construction Structure	3	48	42	6							3		
	20522300	地下建筑工程施工 Underground Engineering Construction	3	48	42	6							3		
	20529800	城市地下空间规划及利用 Urban Underground Space Planning and Utilization	2	32	24	8						2			
	20807600	建筑经济与管理 Construction Economics and Management	2	32	32									2	
	20523400	建筑结构抗震 Anti-Earthquake Design of Structure	2.5	40	40									2.5	
	20514400	施工组织 Construction Organization	1.5	24	24									1.5	

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。

土木工程（道路桥梁工程方向）专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	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	728/45.5	608/38	288/18	37 周/37	6	2432+37 周	190
学分所占比例	23.95%		23.95%	20%	9.47%	19.47%	3.16%		100%

勘查技术与工程专业培养方案（卓越工程师计划）

专业名称与代码：勘查技术与工程 081402

专业培养目标：

坚持以马克思主义、毛泽东思想、邓小平理论为指导，培养综合知识、能力、素质各方面全面发展人才；系统掌握勘查技术与工程专业所需的基本理论、基本方法和专业技能，接受系统的工程实训；具有艰苦朴素、求真务实、创新创业精神；能够在地质钻探、油气钻井、水文地热钻井及工程勘察等相关单位从事设计、装备研制、施工、评价和管理等工作的具有国际视野的复合型高级工程技术人才。毕业后 5 年左右能够在相关领域成为业务骨干、技术负责或项目管理人员。

培养目标可以分解成下面四个子目标：

培养子目标 1：培养坚持以马克思主义、毛泽东思想、邓小平理论、三个代表及科学发展观为指导，遵纪守法、乐于奉献、德智体美劳与健康个性和谐统一、全面发展的社会主义事业合格建设者和可靠接班人。

培养子目标 2：在坚持“宽口径、厚基础、强素质、重应用”的前提下，立足国际化、信息化、一体化发展要求，着眼国内市场化、专业化、社会化的发展趋势，以钻探理论为基础，具备学科交叉知识，培养系统掌握勘查技术与工程专业基本理论、基本方法和基本技术的创新创业人才。

培养子目标 3：具有综合运用勘查技术与工程专业知识解决复杂工程实际问题的综合能力、国际视野、跨文化交流、竞争与合作的初步能力；具备勘查技术与工程新技术、新方法创新能力。

培养子目标 4：能在地质钻探、油气钻井、水文地热钻井、工程勘察等相关单位从事设计、装备研制、施工、评价和管理等工作，并具有创新精神、实践能力的复合型高级工程技术人才。

专业毕业要求：

（1）能够综合运用数学、力学、化学、机械学、材料学、勘查技术与工程专业基础和专业知识，解决复杂地质钻探、油气钻井、水文地热钻井及工程勘察问题。

（2）能够应用数学、力学、化学、机械学、材料学、电子电工学和勘查技术与工程相关的基本科学原理识别、表达、并通过文献研究分析复杂地质钻探、油气钻井、水文地热钻井及工程勘察问题，以获得有效结论。

（3）能针对勘查技术与工程过程中发生或可能发生的复杂问题，设计满足工程需求的勘查系统、设备机具、材料和工艺流程，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）能够基于力学、地质学和钻探的基本原理与方法，包括实验设计、机理分析、数据处理等，研究探索复杂地质钻探、油气钻井、水文地热钻井及工程勘察相关问题，并通过信息采集、数据分析及独立判断综合得到合理有效的结论。

（5）能够针对复杂勘查工程，开发、选择与使用恰当的检测技术、数值模拟和先进的施工工艺等现代工程工具和文献检索等信息技术工具，设计工程方案、工程实施及其过程中复杂问题的解决方案，并对其适应性及效果进行预测评估。

（6）能够基于工程相关的勘查技术与工程专业知识进行合理分析、评价工程实践和复杂地质钻探、油气钻井、水文地热钻井及工程勘察解决方案，遵循以人为本、与区域文化和谐等原则。

（7）具有环境意识及社会担当责任感，设计的工程方案、工程实施及其过程中复

杂问题的解决方案符合“造福社会”这一工程要旨。

（8）具有良好的敬业精神、职业道德、社会科学素养、社会责任感，了解行业技术标准、相关政策、法律和法规，能够在工程实践中理解并遵守行业的职业道德和行业规范，履行相关责任。

（9）具有较强的环境适应能力和团队合作精神，能够在多学科、多文化背景下的团队中承担个体或负责人的角色。

（10）具有较强的语言、文字表达能力以及人文社会科学素养，能够就工程问题与业界同行及社会公众进行有效沟通和交流。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。

（11）具备基本的工程经济和工程管理知识，具有组织管理、统筹及整合资源的能力，能够在多学科、多文化环境中应用。

（12）具有终生教育和继续学习的意识，面对本行业及相关领域技术、个人职业及社会和环境的各种变迁，具有较强的自我获取知识、信息收集能力，以及适应、处理能力，能及时了解相关领域最新理论、技术及国际前沿动态。

毕业要求实现及途径：

序号	毕　业　要　求	实现途径（教学过程）
1	能够综合运用数学、力学、化学、机械学、材料学、勘查技术与工程专业基础和专业知识，解决复杂地质钻探、油气钻井、水文地热钻井及工程勘察问题。	**①课堂教学：**开设高等数学、线性代数、概率论与数理统计、大学物理、大学化学、理论力学、材料力学、流体力学、机械设计基础、机械制图、工程地质学基础等课程。 **②课外学习：**培养学生课外阅读兴趣，引导学生合理挑选相关图书文献资料，为学生开展专题讲座、学术报告等。
2	能够应用数学、力学、化学、机械学、材料学、电子电工学和勘查技术与工程相关的基本科学原理识别、表达、并通过文献研究分析复杂地质钻探、油气钻井、水文地热钻井及工程勘察问题，以获得有效结论。	**①课堂教学：**地质学基础、土力学、岩体力学、有机化学、电工与电子技术、金属材料与加工、液压传动、地质认识实习、金工实习、勘查技术与工程教学实习、泥浆工艺实习、钻探设备设计与制造实习、机械制图课程设计。 **②课外学习：**鼓励学生多阅读与课堂教学内容相关的书籍文献，为学生安排相应的课程作业、大学生科研立项、学科前沿调研报告。
3	能针对勘查技术与工程过程中发生或可能发生的复杂问题，设计满足工程需求的勘查系统、设备机具、材料和工艺流程，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。	**①课堂教学：**钻探工艺学、钻井与完井工程、钻井液与完井液、金刚石工具设计与制造、水文水井与地热开发、钻探设备等课程，钻具钻头设计与制造工艺实习、钻井工程课程设计、毕业实习和设计。 **②课外学习：**鼓励学生广泛阅读钻探领域的专业书籍和期刊文章，课程作业、大学生科研立项、学科前沿调研报告。

序号	毕 业 要 求	实现途径（教学过程）
4	能够基于力学、地质学和钻探的基本原理与方法，包括实验设计、机理分析、数据处理等，研究探索复杂地质钻探、油气钻井、水文地热钻井及工程勘察相关问题，并通过信息采集、数据分析及独立判断综合得到合理有效的结论。	**①课堂教学**：测试技术与钻井仪表、定向钻进技术、测井原理、非开挖工程学等课程。 **②课外学习**：鼓励学生参加各种新技术专题报告，关注与本专业相关的网络信息，完成课程作业、大学生科研立项、学科竞赛、学科前沿调研报告。
5	能够针对复杂勘查工程，开发、选择与使用恰当的检测技术、数值模拟和先进的施工工艺等现代工程工具和文献检索等信息技术工具，设计工程方案、工程实施及其过程中复杂问题的解决方案，并对其适应性及效果进行预测评估。	**①课堂教学**： C 语言程序设计、C 语言课程设计、物理实验等课程。 **②课外学习**： 鼓励学生参加各种学术报告和科研创新活动，关注与本专业相关的最近最新技术，熟悉常用的文献检索工具，积极利用校内相关实验室，培养学生动手实践能力。
6	能够基于工程相关的勘查技术与工程专业知识进行合理分析、评价工程实践和复杂地质钻探、油气钻井、水文地热钻井及工程勘察解决方案，遵循以人为本、与区域文化和谐等原则。	**①课堂教学**：毛泽东思想与中国特色社会理论体系概论、中国近现代史纲要、体育、军事理论、通识教育选修课、军事训练、工程项目管理 、工程导论等课程。 **②课外学习**： 鼓励学生多参加工程相关领域专家、学者所做的工程案例报告，结合所学专业知识，进行工程案例分析、社会调查，综合考虑各方面因素，制定施工优化方案。
7	具有环境意识及社会担当责任感，设计的工程方案、工程实施及其过程中复杂问题的解决方案符合“造福社会”这一工程要旨。	**①课堂教学**：通识教育选修课、工程项目管理 、工程导论、岩土工程勘察、基础工程概论等课程。 **②课外学习**：开展社会调查、学科竞赛、发明创造、科研报告等活动。增强学生团队意识和提高学生协作精神。
8	具有良好的敬业精神、职业道德、社会科学素养、社会责任感，了解行业技术标准、相关政策、法律和法规，能够在工程实践中理解并遵守行业的职业道德和行业规范，履行相关责任。	**①课堂教学**：马克思主义原理、思想道德修养与法律基础、工程导论、通识教育选修课。 **②课外学习**：入学教育、大学生心理健康教育、形势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等。

序号	毕 业 要 求	实现途径（教学过程）
9	具有较强的环境适应能力和团队合作精神，能够在多学科、多文化背景下的团队中承担个体或负责人的角色。	**①课堂教学：**工程项目管理、通识教育选修课、地质认识实习、勘查技术与工程教学实习、勘查技术与工程生产实习、钻探装备与制造实习（企业实习）、钻具钻头设计与制造实习（企业实习）、泥浆工艺实习、毕业实习与设计。 **②课外学习：**入学教育、大学生心理健康教育、形势与政策教育、就业指导、毕业教育、班主任和辅导员的专题讲座、学术讲座等。 鼓励学生广泛阅读工程管理和经济决策的专业书籍文献，组织学生参加各种科技活动。
10	具有较强的语言、文字表达能力以及人文社会科学素养，能够就工程问题与业界同行及社会公众进行有效沟通和交流。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：**大学英语、通识教育选修课。 **②课外学习：**鼓励学生多去图书馆、多登录国内外各类电子期刊和图书服务网站。获得文献检索的能力，了解相关领域技术的最新研究成果，撰写学科前沿报告，参加科技论文报告会、学术讲座、撰写科技论文、参与教师科研项目等。
11	具备基本的工程经济和工程管理知识，具有组织管理、统筹及整合资源的能力，能够在多学科、多文化环境中应用。	**①课堂教学：**思想道德修养与法律基础、工程导论、通识教育选修课、工程项目管理、基础工程概论。 **②课外学习：**鼓励学生参与大学生科研立项、学科竞赛、学科前沿调研报告、教师科研项目等。
12	具有终生教育和继续学习的意识，面对本行业及相关领域技术、个人职业及社会和环境的各种变迁，具有较强的自我获取知识、信息收集能力，以及适应、处理能力，能及时了解相关领域最新理论、技术及国际前沿动态。	**①课堂教学：**工程导论、通识教育选修课、C语言课程设计、机械制图课程设计、钻井工程课程设计、毕业实习和设计、社会调查。 **②课外学习：**完成课程作业，鼓励学生开展社会调查、学科竞赛、发明创造、科研报告、大学生科研立项等活动。

主干学科：石油与天然气工程；地质资源与地质工程 。

专业核心课程：机械设计基础、金属材料与加工、流体力学、液压传动、有机化学、钻探工艺学（岩心钻探学）、钻井液与完井液、钻探设备、测试技术与钻井仪表、工程项目管理、钻井与完井工程、测井原理、金刚石工具设计与制造、定向钻进技术、地质学基础、工程力学、电工电子技术等。

主要专业实验：常见岩矿鉴定、岩土力学性质测试、电工电子技术，测试技术及钻

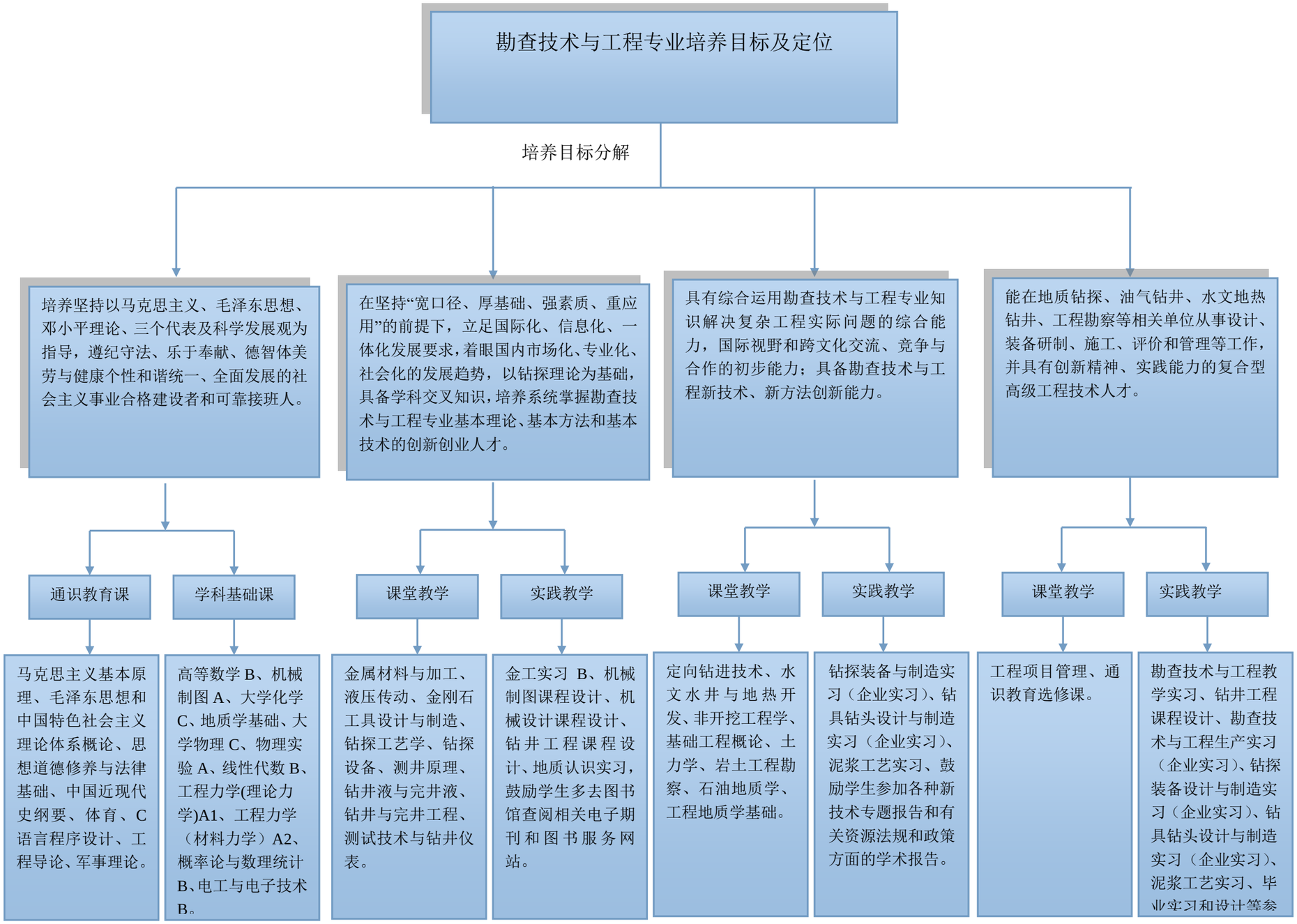
井仪表、钻孔轨迹参数的测试，泥浆性能测试、钻探设备及工艺。

主要实践性教学环节：包括地质认识实习、勘查技术与工程教学实习、课程设计、勘查技术与工程生产实习、泥浆工艺实习、钻探装备设计与制造实习（各种流行的钻机、泥浆泵、动力机等）、钻具钻头设计与制造实习（绳索取心钻具、液动冲击器、钻具组合、钻杆柱、卡簧、孔底动力钻具等；不同用途的钻头，如：全面钻头、取心钻头、造斜钻头；不同材料制作的钻头，如：硬质合金牙轮钻头、金刚石钻头、复合片钻头等），勘查技术与工程毕业实习和毕业设计等 。

修业年限：四年。

授予学位：工学学士。

相近专业：地质工程、石油工程、资源勘查工程、煤及煤层气工程。


勘查技术与工程专业培养目标及定位
培养目标分解
培养坚持以马克思主义、毛泽东思想、邓小平理论、三个代表及科学发展观为指导，遵纪守法、乐于奉献、德智体美劳与健康个性和谐统一、全面发展的社会主义事业合格建设者和可靠接班人。
在坚持“宽口径、厚基础、强素质、重应用”的前提下，立足国际化、信息化、一体化发展要求，着眼国内市场化、专业化、社会化的发展趋势，以钻探理论为基础，具备学科交叉知识，培养系统掌握勘查技术与工程专业基本理论、基本方法和基本技术的创新创业人才。
具有综合运用勘查技术与工程专业知识解决复杂工程实际问题的综合能力，国际视野和跨文化交流、竞争与合作的初步能力；具备勘查技术与工程新技术、新方法创新能力。
能在地质钻探、油气钻井、水文地热钻井、工程勘察等相关单位从事设计、装备研制、施工、评价和管理等工作，并具有创新精神、实践能力的复合型高级工程技术人才。
通识教育课
学科基础课
课堂教学
实践教学
课堂教学
实践教学
课堂教学
实践教学
马克思主义基本原理、毛泽东思想和中国特色社会主义理论体系概论、思想道德修养与法律基础、中国近现代史纲要、体育、C语言程序设计、工程导论、军事理论。
高等数学B、机械制图A、大学化学C、地质学基础、大学物理C、物理实验A、线性代数B、工程力学(理论力学)A1、工程力学（材料力学）A2、概率论与数理统计B、电工与电子技术B。
金属材料与加工、液压传动、金刚石工具设计与制造、钻探工艺学、钻探设备、测井原理、钻井液与完井液、钻井与完井工程、测试技术与钻井仪表。
金工实习 B、机械制图课程设计、机械设计课程设计、钻井工程课程设计、地质认识实习，鼓励学生多去图书馆查阅相关电子期刊和图书服务网站。
定向钻进技术、水文水井与地热开发、非开挖工程学、基础工程概论、土力学、岩土工程勘察、石油地质学、工程地质学基础。
钻探装备与制造实习（企业实习）、钻具钻头设计与制造实习（企业实习）、泥浆工艺实习、鼓励学生参加各种新技术专题报告和有关资源法规和政策方面的学术报告。
工程项目管理、通识教育选修课。
勘查技术与工程教学实习、钻井工程课程设计、勘查技术与工程生产实习（企业实习）、钻探装备设计与制造实习（企业实习）、钻具钻头设计与制造实习（企业实习）、泥浆工艺实习、毕业实习和设计等参

Program for Exploration Technology and Engineering

Program and Code: Exploration Technology and Engineering, 081402

Program Objectives:

The program aims to cultivate comprehensively developed undergraduates with good knowledge, ability and manner, under the guidance of Marxism-Leninism, Mao Tse-tung Thought and Deng Xiaoping Theory. The students can master basic theories, professional knowledge and skills required by this program, and are trained with systematic engineering practices. They will possess hardworking, pragmatic and innovative spirits. They will have the ability to design, develop, construct, evaluate and manage borehole drilling in the areas related to geology, oil & gas, hydrology, geothermal energy and engineering project construction. The students can become senior engineering talents with international vision. About 5 years after graduation, they can become business leaders, technical managers or project managers.

The program objective is divided into four sub objectives:

Sub objective 1：The program aims to cultivate the qualified socialist constructer and successor who are law-abiding, dedicated, healthy, and comprehensive development in morality, intelligence, physique and art, under the guidance of Marxism-Leninism, Mao Tse-tung Thought, Deng Xiaoping Theory, Three Representatives and Scientific Outlook on Development.

Sub objective 2：According to the guiding principle of "widening scope, deepening foundation, extending capability, strengthening application", the program aims to cultivate , innovative entrepreneurial undergraduates who possess basic theories, interdisciplinary knowledge, and professional skills required by the program.

Sub objective 3：The program aims to cultivate undergraduates who possess comprehensive abilities to utilize knowledge of exploration technology and engineering to solve practical problems in complex engineering projects. They also have preliminary consciousness of international vision, cross-cultural communication, competition and cooperation, and an ability of developing new exploration and engineering technologies and new methods.

Sub objective 4：The program aims to cultivate undergraduates who haveengineering abilities to design, research, construct, evaluate and manage borehole drilling in the areas related to geology, oil & gas, hydrology, geothermal energy and engineering project construction, etc..

Program requirements：

（1）Students can use the basic and professional knowledge of mathematics, mechanics, chemistry, materials science, and exploration technology and engineering to solve the problems in complicated drilling operations in geology, oil & gas, hydrology, geothermal energy and engineering project construction.（2）Students can apply basic scientific principles of mathematics, chemistry, mechanics, materials science, electronics and electrical engineering, and exploration technology to identify, illustrate and analyze the complicated .`

（3）Students can design the effective exploration system, equipment, material and technique to solve complex problems that occur or possibly occur in the exploration technology and engineering process. The design scheme should include the innovative

consciousness and take into account society, healthy, safety, law, culture and environment, etc.

（4）Student can use the basic principles and methods (include experimental design, mechanism analysis and data processing etc.) of mechanics, geology and drilling to research drilling problems related to the complicated geology , oil & gas, hydrology, geothermal energy and engineering project construction.. They can draw right conclusions through information collection, data analysis and their independent judgment.

（5）Students can deal with complex exploration projects by developing or using appropriate engineering tools (such as monitoring technology, numerical simulation and advanced construction techniques etc.) and literature search toolsto design and propose project plans, project implementation procedures and solutions of complex engineering problems. Furthermore, they can evaluate adaptability and effectiveness of their designs.

（6）Students can scientifically analyze and evaluate solutions of practical drilling projects related to complicated geology, oil & gas, hydrology, geothermal energy and construction survey, following principles of people-oriented and harmonious regional cultures.

（7）Students should have environmental awareness and social responsibility. Their work for project design, implementation and the solution to the complex engineering problems can satisfy the objective of "benefiting the society".

（8）Students should have a good sense of professionalism, occupation morals, scientific literacy and social responsibility. They can understand the technical standards, policies, laws and regulations in industry, and follow them to fulfill their responsibility.

（9）Students have a strong ability to accommodate themselves to circumstances and possess a team spirit. They can play a suitable role in a multi-disciplinary, multi-cultural team.

（10）Students have a relatively strong quality of writing , speaking ,and humanistic and social science literacy. They can communicate effectively with the industry and the public on engineering problems.

（11）Students have the basic knowledge of engineering economics and project management, and can organize, manage and integrate resources to realize their goals in multi discipline and multi culture environment.

（12）Students can have a lifelong and continuing learning consciousness and adapt to the various changes of industry and related technologies, personal occupations and society. They can have a strong ability of self-study, information collection, adaptability and coping ability, and understand the latest theories, technologies and international cutting-edge developments in relevant fields.

The followings are graduation requirements and approaches:

No.	Graduation requirements	Approaches
1	Be able to synthesize the basic and professional knowledge of mathematics, mechanics, chemistry, mechanics, materials science, electronic electrotechnics, exploration technology and engineering, and solve the problems in complicated geological drilling, oil & gas drilling,	①Courses in class: Advanced Mathematics, Linear Algebra, Probability and Mathematical Statistics, College Physics, College Chemistry, Theoretical Mechanics, Mechanics of Materials, Hydromechanics, Fundamentals of Mechanical Design, Mechanical Drawing, Basic Engineering Geology, etc. ②Learning after class: Develop students' interest in

No.	Graduation requirements	Approaches
	hydrological geothermal drilling and exploration.	reading literature after class, guide students to relevant books and publications, and host lectures, academic seminars, etc..
2	Be able to apply basic scientific principle of mathematics, mechanics, chemistry, mechanics, materials science, electronic electrotechnics and exploration technology to identify, illustrate and analyze the complicated geological drilling, oil & gas drilling, hydrological geothermal drilling and exploration, and to draw the effective conclusion.	① Courses in class: Fundamentals of Geology, Soil Mechanics, Rock Mass Mechanics, Organic Chemistry, Electrical and Electronic Technology, Metal Materials and Machining, Hydraulic Control, Primary Geological Field Training, Practice of Metal Processing Technique, Exploration Technology and Engineering Practice Teaching, Practice of Drilling Fluids, Practice of Design and Production for Drilling Equipments, Course Design of Mechanical Drawing, etc.. ② Learning after class: Encourage students to read more books related to the course work. Set and design the corresponding assignments, undergraduate research project, as well as state-of-the-art technology review report.
3	Be able to design the effective exploration system, equipment, material and technique to solve the complex problem that occurs or possibly occurs in the engineering process. The design scheme includes the innovative consciousness and considers society, healthy, safety, law, culture and environment, etc.	①Courses in class: Drilling Technology, Drilling & Completion Engineering, Drilling Fluids and Engineering Fluids, Design and Manufacture of Diamond Tools, Hydrological Wells and Geothermal Production, Drilling Equipment. Practice of Design and Production for Drilling Tools and Bits, Course Design of Drilling and Completion, Practice and Thesis for Graduation. ②Learning after class: Encourage students to browse extensively in the field of drilling professional books and journal articles, course homework, research projects, research report.
4	Be able to use the basic principle and method (include experimental design, mechanism analysis and data processing etc.) of mechanics, geology and drilling to research the problem related to the complicated geological drilling, oil & gas drilling, hydrological geothermal drilling and exploration. Be able to draw the conclusion through information collection, data analysis and independent judgment.	① Courses in class: Measurement Technology and Drilling Apparatus, Directional Drilling Technology, Logging Principles, Trenchless Engineering ② Learning after class: Encourage students to participate in a variety of new technological seminars, pay attention to the internet resource related to the major, and finish the course work, undergraduate research projects, academic competition, discipline frontier research report.

No.	Graduation requirements	Approaches
5	Be able to deal with complex exploration engineering and develop, select, and use the appropriate engineering tools (such as monitoring technology, numerical simulation and advanced construction technique etc.) and information technology tools (literature review) to design project plan, project implementation and the solution of complex engineering problem. Furthermore, the adaptability and effectiveness of them are evaluated.	① Courses in class: C Programming Language, Course Design for C Programming, Physical Experiments. ② ② Learning after class: Encourage students to participate in a variety of new technical reports, pay attention to the internet resource related to the major, and to finish the course work, undergraudate research projects, academic competition, discipline frontier research report.
6	Be able to base on the engineering related exploration technology and professional knowledge and to scientifically analyze, evaluate the solution of engineering practice, complex geological drill, oil & gas drilling hydrological geothermal drilling and exploration, following the principle of people-oriented, harmonious with regional culture.	① Courses in class: Introduction to Mao Tse-tung Thought and the Theoretical System of Socialism With Chinese Characteristics,The Essentials of Modern Chinese History, Physical Education, Military Theory, Military Training, Engineering Management, Introduction to Engineering, etc. ②Learning after class: Encourage students to attend the seminars from the experts in the engineering related field, and apply the professional knowledge to perform the real world case analysis, social survey and work out an optimized construction proposal
7	Having environmental awareness and social responsibility, the project design, implementation and the solution to the complex problems in the process satisfy the objective of "benefiting the society".	① Courses in class: Liberal Education Courses (Elective), Engineering Management, Introduction to Civil Engineering, Geotechnical Engineering Investigation, Foundation Engineering. ② Learning after class: Carry out social surveys, academic competitions, inventions, research seminars and other activities and enhance the spirit of teamwork and cooperation.
8	Be able to have a good sense of professionalism, occupation morals, social science, social responsibility. Be able to understand the industry technical standards, policies, laws and regulations. Be able to understand and follow the occupation morals and industry standards and to fulfill the responsibility.	① Courses in class: Principles of Marxism, Morality Education Fun-damentals of Law, Introduction to Engineering, Liberal Education Courses (Eletive) ②Learning after class: Orientation education, college students' psychological health education, situation and policy education, employment guidance, graduation help seesion, seminars given by the class teacher and the instructor, academic seminars, etc.

No.	Graduation requirements	Approaches
9	Have a strong ability to adapt to the environment and team spirit and be able to play the role of individual or responsible person in a multi-disciplinary, multi-cultural team.	① Courses in class: Engineering Management, Liberal Education Courses (Elective),Primary Geological Field Training， Exploration Technology and Engineering Practice Teaching，Exploration and Foundation Project Production Practice，Practice of Design and Production for Drilling Equipments， Practice of Design and Production for Drilling Tools and Bits，Practice of Drilling Fluids，Practice for Graduate and Bachelor Thesis. ②Learning after class: Orientation education, college students' psychological health education, situation and policy education, employment guidance, graduation help session, seminars by the class teacher and the instructor, academic seminars, etc.. Encourage students to read extensively the literature on engineering management and economic decision making, and organize various scientific and technological activities.
10	With strong language, text expression ability and humanities and social science literacy, be able to communicate effectively with the industry peer and the public on engineering problems. Having a certain international vision, it can communicate under the cross-cultural background.	① Courses in class: College English, Liberal Education Courses (Elective). ②Learning after class: Encourage students to visit the library, domestic and international electronic journals and books service website. Develop students' ability to search literature, understand the state-of-the-art technology, and write the review report on the cutting-edge science and technology, participate in the scientific seminars and lectures, write scientific papers, and participate in research projects, etc..
11	Having the basic knowledge of engineering economy and project management, be able to organize, manage and integrate resources and to be applied in multi discipline and multi culture environment.	① Courses in class: Morality Education and Fundamentals of Law，Introduction to Engineering, Liberal Education Courses (Elective),Engineering Management，Foundation Engineering. ②Learning after class: Encourage students to participate in undergraduate research projects, academic competition, research seminars, and research projects, etc..
12	Having lifelong education and continuing learning consciousness and facing the various changes of this industry and related technology field, personal occupation, society and environment, be able to have a strong ability of self-study,	① Courses in class: Introduction to Engineering, Liberal Education Courses (Elective), Course Design for C Programming Language，Course Design of Mechanical drawing，Course Design of Drilling and Completion，Undergraduate Thesis Project，Social Survey. ② Learning after class: Finish the coursework.

No.	Graduation requirements	Approaches
	information collection, adaptability and processing ability, and to understand the relevant fields of the latest theory, technology and international cutting-edge dynamics.	Encourage students to conduct social surveys, academic competitions, inventions, research seminars, undergraduate research projects and other activities

Core disciplines: oil and gas engineering; geological resources and geological engineering.

Core courses: Drilling Technology, Drilling & Completion Engineering, Drilling Fluids and Engineering Fluids, Design and Manufacture of Diamond Tools, Hydrological Wells and Geothermal Production, Drilling Equipment, Measurement Technology and Drilling Apparatus, Directional Drilling Technology, Logging Principles, Fundamentals of Geology, Soil Mechanics, Rock Mass Mechanics, Electrical and Electronic Technology

Core experimental teaching: Common mineral identification, rock and soil mechanics testing, electrical and electronic technology, testing technology and drilling equipment, drilling trajectory parameters testing, mud performance testing, drilling equipment and technology.

Core practical teaching: Geological practice, Exploration technology and engineering practice teaching, curriculum design, exploration technology and engineering technology practice, production practice, mud technology practice, drilling equipment design and manufacturing practice (rig, mud pump, power machine, etc), design and manufacture of drill-bit (coring drill, hydraulic impactor, BHA, drill string, the bottom-hole power drill tool, etc.; different uses of drill-bit, such as: a comprehensive bit, coring bit, sidetracking bit; different materials of drill-bit, such as: Carbide bit, diamond bit, PDC bit, etc.). Exploration technology and engineering graduation practice and graduation design.

Length of schooling: four years

Academic degree：Bachelor of engineering

Related programs: Geological engineering, petroleum engineering, resource exploration engineering, coal and coalbed methane engineering

勘查技术与工程专业课程教学计划表

Course Descriptions of Exploration Technology and Engineering

课程类别 Classification		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	11706200	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32							2			
		120002*0	思想道德修养与法律基础 Morality Education 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 C Language Programming B	2.5	40	28	12			2.5						
		20520200	工程导论 Introduction to Civil Engineering	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**	**604**	**12**		**8.5**	**8**	**7**	**8**	**2**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		212127*2	高等数学 B Advanced Mathematics B	10	160	160			4	6						
		207247*0	机械制图 Mechanical Drawing	5.5	88	88			3	2.5						
		20302403	大学化学 C College Chemistry C	4	64	50	14		4							
		20115000	地质学基础 Fundamentals of Geology	4.5	72	62	10		4.5							

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	212130*3	大学物理 C College Physics C	6	96	96	0			3.5	2.5					
	212132*1	物理实验 A Physical Experiment A	3.5	56	0	56			2	1.5					
	21212802	线性代数 B Linear Algebra B	2.5	40	40					2.5					
	20508011	工程力学（理论力学）A1 Engineering Mechanics (Theoretical Mechanics) A1	5	80	80					5					
	20508021	工程力学（材料力学）A2 Engineering Mechanics (Mechanics of Materials) A2	4.5	72	72						4.5				
	21213502	概率论与数理统计 B Probability and Statistics B	2.5	40	40					2.5					
	20725102	电工与电子技术 B Electrical Engineering and Electrical Technology B	4	64	54	10						4			
	小计 Sum		**52**	**832**	**742**	**90**		**15.5**	**14**	**14**	**4.5**	**4**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	20715201	机械设计基础 A The Fundamentals of Mechanism Design	3.5	56	46	10	机械制图				3.5				
	20724000	金属材料与加工 Metal Materials and Machining	3	48	40	8				3					
	20520700	流体力学 Hydromechanics	2.5	40	36	4	工程力学					2.5			
	20711900	液压传动 Hydraulic Control	2.5	40	36	4	流体力学机械设计					2.5			
	20311403	有机化学 C Organic Chemistry C	2	32	32		大学化学					2			
	20527700	钻探工艺学 Drilling Technology	3	48	40	8	液压传动					3			
	20523800	钻井液与完井液 Drilling Fluids and Engineering Fluids	3	48	40	8	液压传动						3		
	20523900	钻探设备 Drilling Equipment	2.5	40	32	8	机械设计						2.5		
	20524000	测试技术与钻井仪表 Measurement Technology and Drilling Apparatus	2.5	40	32	8	机械设计					2.5			
	20527900	工程项目管理 Project Management	2	32	32		概率统计						2		

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20528000	钻井与完井工程 Drilling & Completion Engineering	2.5	40	36	4	钻探工艺						2.5		
	20502900	测井原理 Logging Principles	2	32	28	4	测试技术					2			
	20512500	金刚石工具设计与制造 Design and Manufacture of Diamond Tools	2	32	26	6	钻探工艺					2			
	20506300	定向钻进技术 Directional Drilling Technology	2	32	24	8	钻探设备						2		
	小计 Sum		**35**	**560**	**480**	**80**		**0**	**0**	**3**	**3.5**	**16.5**	**12**	**0**	**0**
专业选修课 Specialty Elective Courses		具体见专业选修课列表	8	128											
合计 Sub-total			**140.5**	**2328**	**1826**	**182**		**0**	**0**	**3**	**3.5**	**16.5**	**12**	**0**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41919002	C 语言课程设计 B Course Design of C Language B	1.5	1.5 周					1.5						
	40724800	机械制图课程设计 Course Design of Mechanical drawing	0.5	0.5 周					0.5						
	40115200	地质认识实习（北戴河） Geological Field Training	2	2 周			地质学基础		2						
	40724602	金工实习 B Practice of Metal Processing Technique B	2	2 周						2					
	40533500	勘查技术与工程教学实习 Exploration Technology and Engineering Practice Teaching	3	3 周							3				
	40725202	机械设计课程设计 B Practice of Mechanical Design B	2	2 周							2				
	40533600	钻井工程课程设计 Course Design of Drilling and Completion	1.5	1.5 周									1.5		
	40533700	勘查与基础工程生产实习（企业实习） Exploration and Foundation Project Production Practice	4	4 周			钻探工艺							4	

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	40533800	泥浆工艺实习 Practice of Drilling Fluids	2	2 周			钻井液							2	
	40533900	钻探装备设计与制造实习（企业实习） Practice of Design and Production for Drilling Equipments	4	4 周										4	
	40534000	钻具钻头设计与制造实习（企业实习） Practice of Design and Production for Drilling Tools and Bits	3	3 周										3	
	40532200	毕业实习和设计 Practice for Graduate and Bachelor Thesis	16	16 周											16
	小计 Sum		**43.5**	**43.5 周**				**2**	**4**	**2**	**5**	**0**	**1.5**	**13**	**16**
创新创业自主学习 Autonomous Study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	4												
	小计 Sum		**6**												
总计 Total			**190**	**2328 学时 +43.5 周**	**1826**	**182**		**26**	**26**	**26**	**21**	**22.5**	**13.5**	**13**	**16**
可开出专业选修课列表 Specialty Elective Courses	20536800	石油地质学 Petroleum Geology	2	32	28	4							2		
	20528200	水文水井与地热开发 Hydrological Wells and Geothermal Drilling	2	32	28	4						2			
	20536900	基础工程概论 Introduction to Foundation Engineering	2	32	28	4							2		
	20506800	非开挖工程学 Trenchless Engineering	2	32	26	6							2		
	20520302	土力学 B Soil Mechanics	3	48	40	8					3				
	20528400	工程地质学基础 B Basic Engineering GeologyB	2	32	28	4					2				
	20517500	岩土工程勘察 Engineering Geologic Survey	2.5	40	40	0						2.5			

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课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	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	832/52	560/35	128/8	43.5 周/43.5	6	2328+43.5 周	190
学分所占比例	23.95%		27.37%	18.42%	4.21%	22.89%	3.15%		100%

安全工程专业培养方案

专业名称与代码：安全工程　081002

专业培养目标：

1、本专业坚持马克思列宁主义、毛泽东思想、邓小平理论、“三个代表”重要思想、科学发展观为指导，培养遵纪守法，为社会主义建设服务，与生产劳动相结合，德、智、体全面发展的社会主义事业的建设者和接班人；

2、培养适应社会主义市场经济发展的需要，掌握安全科学、安全工程及技术的基础理论、基本知识、基本技能，具备一定的从事安全工程方面的设计、研究、检测、评价、监察和管理等工作的基本能力和素质，能在能源、建设工程、石化工程和矿业工程等高风险行业从事安全监理、监测、监察等技术或管理工作。

专业毕业要求：

1、具有较扎实的自然科学基础和安全工程知识，能够将数学、自然科学、安全工程基础和专业知识用于解决石油化工、建筑工程等领域的复杂安全工程问题；

2、具有安全问题分析能力，能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析复杂安全工程问题，以获得有效结论；

3、具备安全设计能力和初步的科学研究能力，掌握本质安全设计、工程安全设计、人机工程设计的基本理论知识和文献检索、资料查询的基本方法，能够设计针对复杂安全工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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、熟练掌握主要测试和实验仪器使用的基本技能，了解安全检测与监测的基础知识与理论，掌握安全设施检测的方法与技术，具有从事风险监测设计与检测的能力，能够基于科学原理并采用科学方法对复杂安全工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论；

5、熟练掌握安全信息化技术，了解安全模拟仿真方法和技术，能够针对复杂安全工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，对复杂安全工程问题进行预测与模拟，并能够理解其局限性；

6、能够基于安全工程相关背景知识进行合理分析，具备从事安全评价的能力，熟练掌握风险辨识与评估、风险控制效果评估的方法与理论，在熟练掌握安全生产法律框架体系基础上，评价安全工程实践和复杂安全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；

7、具有强烈的安全环保意识和社会责任感，能够理解和评价针对复杂安全工程问题的工程实践对环境、社会可持续发展的影响；

8、具有人文社会科学素养和职业素养，能够在安全工程实践中理解并遵守职业道德和规范，履行责任；

9、具备安全专业素养和团队协作能力，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。

10、具备有效沟通和交流能力，掌握报告撰写、文稿设计、陈述发言等交流手段就复杂安全工程问题与业界同行及社会公众进行有效沟通和交流以及回应社会对安全问题的关切等。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；

11、理解并掌握基本安全管理知识，具备企业安全管理体系设计能力，并具有综合安全管理和经济决策，并能在交叉学科环境下应用；

12、具备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	具有较扎实的自然科学基础和安全工程知识，能够将数学、自然科学、安全工程基础和专业知识用于解决石油化工、建筑工程等领域的复杂安全工程问题。	①课堂教学：线性代数、概率论、大学物理、大学化学、工程力学 、流体力学、电工与电子技术、计算机、地质学基础、建筑工程概论、油气勘探开发、采矿工程概论。 ②课外学习：鼓励学生扩大视野范围，通过兴趣组、创新发明了解前沿技术，开展大学物理实验、计算机 C 语言课程设计实习等实践教学活动。组织学生参加石油化工、建筑等企业的生产实习与教学实习。
2	具有安全问题分析能力，能够应用数学、自然科学和工程科学的基本原理，识别、表达、并通过文献研究分析复杂安全工程问题，以获得有效结论。	①课堂教学：机械制图、工程制图、机械基础设计、金属材料与零件加工 ②课外学习：机械制图课程设计、CAD 设计、金工实习等实践课程
3	具备安全设计能力和初步的科学研究能力，掌握本质安全设计、工程安全设计、人机工程设计的基本理论知识和文献检索、资料查询的基本方法，能够设计针对复杂安全工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，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。	①课堂教学：传热与传质、机械安全工程、安全人机工程、电气安全工程、通风与除尘工程、噪声与振动、建筑施工安全、消防工程、化工安全、环境工程、安全心理与行为。 ②课外学习：传热与传质实验、机械安全设计实验、人机工程实验、电气安全实验、通风实验、噪声与振动实验、施工安全设计实验、消防工程课程设计，并通过教学实习、生产实习增强学生的安全设计能力。

序号	毕 业 要 求	实现途径（教学过程）
4	熟练掌握主要测试和实验仪器使用的基本技能，了解安全检测与监测的基础知识与理论，掌握安全设施检测的方法与技术，具有从事风险监测设计与检测的能力，能够基于科学原理并采用科学方法对复杂安全工程问题进行研究，包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论	①课堂教学：锅炉压力容器安全、通风与除尘工程、噪声与振动、安全检测与监控技术、职业卫生、失效分析 、疲劳与断裂、化工安全 ②课外学习：压力容器检测实验、安全检测与空气采样实验、职业卫生分析实验、机械失效实验、化工安全检测实验，并通过教学实习、生产实习增强学生的安全检测能力。
5	熟练掌握安全信息化技术，了解安全模拟仿真方法和技术，能够针对复杂安全工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具，对复杂安全工程问题进行预测与模拟，并能够理解其局限性；	①课堂教学：安全系统工程、火灾与爆炸灾害控制、噪声与振动、通风与除尘工程、安全信息技术、建筑施工安全、化工安全、矿山安全、消防工程。 ②课外学习： 火灾与爆炸实验、风险分析与评估课程设计，并通过生产、教学实习，了解安全信息化的基本知识，掌握安全模拟仿真方法和技术。
6	能够基于安全工程相关背景知识进行合理分析，具备从事安全评价的能力，熟练掌握风险辨识与评估、风险控制效果评估的方法与理论，在熟练掌握安全生产法律框架体系基础上，评价安全工程实践和复杂安全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；	①课堂教学：安全系统工程、安全管理学、安全心理与行为、安全经济与工作保险、应急救援、建筑施工安全、油气勘探、矿山安全、交通安全、职业安全健康管理体系、安全法学 ②课外学习： 通过安全工程综合课程设计、安全技术课程设计，全面提高学生安全知识综合应用能力，通过生产实习、毕业实习增强学生对企业生产安全管理的了解，加深安全管理实际应用的认识。
7	具有强烈的安全环保意识和社会责任感，能够理解和评价针对复杂安全工程问题的工程实践对环境、社会可持续发展的影响。	①课堂教学：安全管理学、安全心理与行为、安全经济与工作保险、应急救援、建筑施工安全、油气勘探、矿山安全、交通安全、职业安全健康管理体系、安全法学。 ②课外学习：国内外各类电子期刊和图书服务网站
8	具有人文社会科学素养和职业素养，能够在安全工程实践中理解并遵守职业道德和规范，履行责任	①课堂教学：安全管理学、安全心理与行为、安全经济与工作保险、职业安全健康管理体系、安全法学。 ②课外学习：通过生产实习、毕业实习增强学生对

序号	毕 业 要 求	实现途径（教学过程）
		企业生产安全管理的了解，加深对安全安全职业道德修养的认识。
9	具备安全专业素养和团队协作能力，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	通过安全工程综合课程设计、安全技术课程设计，全面提高学生的个体设计能力和团队协作应用能力。
10	备有效沟通和交流能力，掌握报告撰写、文稿设计、陈述发言等交流手段就复杂安全工程问题与业界同行及社会公众进行有效沟通和交流以及回应社会对安全问题的关切等。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	通过安全工程综合课程设计、安全技术课程设计、生产实习、毕业实习等全面提高学生在报告撰写、文稿设计、陈述发言等交流能力的提升。
11	理解并掌握基本安全管理知识，具备企业安全管理体系设计能力，并具有综合安全管理和经济决策，并能在交叉学科环境下应用	①课堂教学：安全管理学、安全心理与行为、安全经济与工作保险、职业安全健康管理体系、安全法学。 ②课外学习： 通过安全工程综合课程设计、安全技术课程设计，全面提高学生安全知识综合应用能力，通过生产实习、毕业实习增强学生对企业生产安全管理的了解，加深安全管理实际应用的认识。
12	具备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	毕业设计

主干学科：安全工程;系统工程;力学;工程管理;工业工程。

核心课程： 安全系统工程、通风与防尘、火灾爆炸、消防工程、电气安全、传热与传质、安全人机工程、安全检测技术。

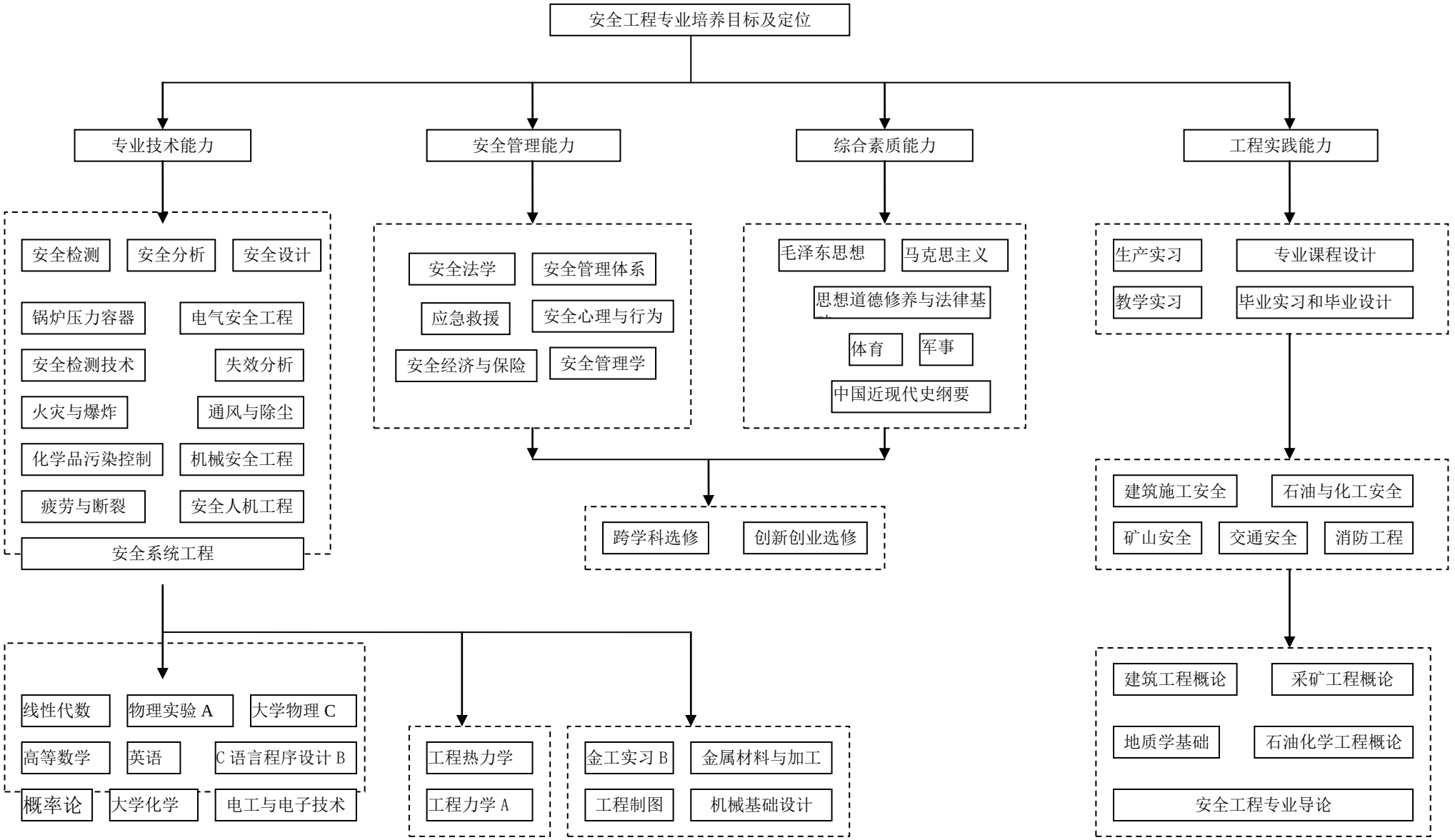
主要专业实验：通风与防尘、电气安全检测试验、锅炉压力容器试验、燃烧与爆炸性能试验、人机工程试验、噪声与振动检测、材料疲劳与断裂实验。

主要实践性教学环节：包括地质实习、金工实习、教学实习、生产实习、毕业实习与设计、专业课程设计等。

修业年限：四年。

授予学位：工学学士。

相近专业： 消防工程、环境工程、工业工程。


安全工程专业培养目标及定位
专业技术能力
安全管理能力
综合素质能力
工程实践能力
安全检测
安全分析
安全设计
锅炉压力容器
电气安全工程
安全检测技术
失效分析
火灾与爆炸
通风与除尘
化学品污染控制
机械安全工程
疲劳与断裂
安全人机工程
安全系统工程
安全法学
安全管理体系
应急救援
安全心理与行为
安全经济与保险
安全管理学
毛泽东思想
马克思主义
思想道德修养与法律基
体育
军事
中国近现代史纲要
跨学科选修
创新创业选修
生产实习
专业课程设计
教学实习
毕业实习和毕业设计
建筑施工安全
石油与化工安全
矿山安全
交通安全
消防工程
线性代数
物理实验 A
大学物理 C
高等数学
英语
C 语言程序设计 B
概率论
大学化学
电工与电子技术
工程热力学
工程力学 A
金工实习 B
金属材料与加工
工程制图
机械基础设计
建筑工程概论
采矿工程概论
地质学基础
石油化学工程概论
安全工程专业导论

Program For Safety Engineering

Program Name and Code: Safety Engineering 081002

Training Objective：

1. The major aims at cultivating engineer obeying the laws，performing excellent morality, intelligence and physical training and dedicating themselves to the socialism construction in practical work under the instruction of Marxism,Mao Zedong Thought , Deng Xiaoping Theory and the important thinking of the 'Three Represents' .

2. Those students will obtain the ability to innovate and learn the basic theory and fundamental knowledge of engineering mechanics, Geology , Machine design and ergonomics engineering , safety system and so on. The safety engineering will develop the professionals with the qualities and abilities of safety testing, monitoring, evaluation , design and management. The graduates will mainly engage in safety supervision, monitoring, supervision or management technology in the high risk areas of energy, construction , petrochemical engineering and mining engineering.

Required Knowledge and Ability:

1. They have a solid foundation of natural science and safety engineering knowledge, can be mathematics, natural sciences, safety engineering foundation and professional knowledge to solve the petrochemical, construction and other areas of complex security engineering problems.

2. They have the ability to analyze security problems, can apply the basic principles, identification and expression of mathematics, natural sciences and engineering science, and analyze the complex safety engineering problems through literature research to obtain effective conclusions.

3. They have the ability to design safety and the initial scientific research ability, master the basic safety design, engineering safety design, ergonomic design of the basic theoretical knowledge and literature retrieval, data query the basic method, to design for complex security engineering problems. To design systems, units (components) or processes that meet specific needs, and to reflect innovation in the design process, taking into account social, health, safety, legal, cultural and environmental factors;

4. To master the basic skills used in major testing and laboratory equipment, to understand the basic knowledge and theory of safety detection and monitoring, to master the safety equipment testing methods and techniques, with the ability to

engage in risk monitoring design and testing, based on scientific principles and Scientific methods for complex security engineering issues, including design experiments, analysis and interpretation of data, and through information synthesis to be reasonable and effective conclusions;

5. To master the safety information technology, to understand the safety simulation methods and techniques, to the complex safety engineering problems, development, selection and use of appropriate technology, resources, modern engineering tools and information technology tools, complex safety engineering issues to predict With simulation, and able to understand its limitations;

6. Based on the background knowledge of safety engineering can be reasonably analyzed, have the ability to engage in safety evaluation, master the risk identification and assessment, risk control effect assessment methods and theories, in the mastery of safety production legal framework system, based on the evaluation of safety engineering Practical and complex safety engineering problem solutions to social, health, safety, legal and cultural impacts and to understand the responsibilities that should be borne;

7. Have a strong sense of safety and environmental awareness and social responsibility, to understand and evaluate the complexity of the engineering problems for environmental and social sustainable development of the impact;

8. With the humanities and social science literacy and professional quality, in the safety engineering practice to understand and abide by professional ethics and norms, to fulfill their responsibilities;

9. Ability to work with security expertise and teamwork to take on individual, team members, and responsible roles in a multidisciplinary team.

10. Have effective communication and communication skills, master the report writing, document design, statements and other means of communication on the complex security engineering issues and industry peers and the public to communicate and communicate effectively and respond to social concerns about security issues. And have a certain international perspective, to cross-cultural background to communicate and exchange;

11. Understand and master the basic safety management knowledge, with enterprise safety management system design capabilities, and has integrated security management and economic decision-making, and can be applied in the interdisciplinary environment;

12. With independent learning and lifelong learning awareness, have the ability to continue to learn and adapt to development.

Graduation requirements and ways to achieve：

NO.	Training Requirements	Realization Approachs
1	They have a solid foundation of natural science and safety engineering knowledge, can be mathematics, natural sciences, safety engineering foundation and professional knowledge to solve the petrochemical, construction and other areas of complex security engineering problems.	① The Classroom Teaching: Linear Algebra, Probability and Mathematics Statics, College Physics, College Chemistry, Fluid Mechanics, Engineering Mechanic，Electrician and Electron , Computer Science, Fundamentals of Geology, Principles of Construction Engineering, Petroleum Exploration and Development, Principles of Mining Engineering ② Extracurricular Learning: Students are encouraged to expand the field of view, to understand the forefront of technology through interest groups, innovation and invention, to carry out college physics experiment, the computer C language curriculum design internships and other practical teaching activities. Organize students to participate in the petrochemical industry, construction and other companies producing practice and teaching practice.
2	They have the ability to analyze security problems, can apply the basic principles, identification and expression of mathematics, natural sciences and engineering science, and analyze the complex safety engineering problems through literature research to obtain effective conclusions.	① The Classroom Teaching: Mechanical Drawing, Engineering Drawing, Fundamentals of Machine Design, Metallic Materials and Parts Processing ② Extracurricular Learning: Course project design of Mechanical Drawing, Course project design of CAD, Bench Work Practice and other field courses.
3	They have the ability to design safety and the initial scientific research ability, master the basic safety design, engineering safety design, ergonomic design of the basic theoretical knowledge and literature retrieval, data query the basic method, to design for complex security	① The Classroom Teaching: Heat and Mass Transfer , Mechanical Safety Engineering, Safety Ergonomics Engineering, Electric Safety Engineering, Ventilation and Dust Control, Noise and Vibration, Construction Safety, Fire Engineering, Chemical Industry Safety. ② Extracurricular Learning：

NO.	Training Requirements	Realization Approachs
	engineering problems. To design systems, units (components) or processes that meet specific needs, and to reflect innovation in the design process, taking into account social, health, safety, legal, cultural and environmental factors.	**Experiment of Heat and Mass Transfer, Experiment of Mechanical Safety Design, Experiment of Ergonomics, Experiment of Electric Safety, Experiment of Ventilation, Experiment of Noise and Vibration, Experiment of Construction Safety Design, Course project design of Fire Engineering. Enhance safety design ability of students through the teaching practice, production practice.**
4	**To master the basic skills used in major testing and laboratory equipment, to understand the basic knowledge and theory of safety detection and monitoring, to master the safety equipment testing methods and techniques, with the ability to engage in risk monitoring design and testing, based on scientific principles and Scientific methods for complex security engineering issues, including design experiments, analysis and interpretation of data, and through information synthesis to be reasonable and effective conclusions.**	**① The Classroom Teaching： Boiler and pressure vessel safety, Ventilation and Dust Control, Noise and Vibration, Safety detectiong and monitoring, Occupational Health, Failure Analysis, Fatigue and Fracture. ② Extracurricular Learning： Pressure vessel testing, security testing and air sampling experiment, occupation health analysis experiment, mechanical failure experiment, chemical safety testing. Enhance security detectionability of students through the teaching practice, production practice.**
5	**To master the safety information technology, to understand the safety simulation methods and techniques, to the complex safety engineering problems, development, selection and use of appropriate technology, resources, modern engineering tools and information technology tools, complex safety engineering issues to predict With simulation, and able to understand**	**① The Classroom Teaching： Safety System Engineering , Fire & Explosion Control, Noise and Vibration, Ventilation and Dust Control, Industrial Toxicology, Construction Safety, Chemical Industry Safety, Mine Safety, Fire Engineering. ② Extracurricular Learning： Fire and explosion experiment, course project design of risk analysis and evaluation. And understand the fire assessment of basic knowledge, master the method of safety assessment through the construction, petroleum**

NO.	Training Requirements	Realization Approachs
	its limitations.	**chemical industry, mining and other enterprises in production, teaching practice.**
6	**Based on the background knowledge of safety engineering can be reasonably analyzed, have the ability to engage in safety evaluation, master the risk identification and assessment, risk control effect assessment methods and theories, in the mastery of safety production legal framework system, based on the evaluation of safety engineering Practical and complex safety engineering problem solutions to social, health, safety, legal and cultural impacts and to understand the responsibilities that should be borne.**	**① The Classroom Teaching：** **Safety System Engineering, Safety management Engineering, Psychology and Behavior Safety, Economic security and insurance, Emergency rescue, Construction Safety, Petroleum Exploration, Mine Safety, Transportation Safety, OSHMS, Safety Legislation.** **② Extracurricular Learning：** **Students can improve the safety of the comprehensive ability of applying knowledge through the integrated curriculum of safety engineering design, safety technology curriculum design. Enhance students' understanding of the enterprise safety production management and deepen students' understanding of the practical application of the safety management through production practice, graduation practice.**
7	**Have a strong sense of safety and environmental awareness and social responsibility, to understand and evaluate the complexity of the engineering problems for environmental and social sustainable development of the impact.**	**① The Classroom Teaching：** **In the teaching process introduce students to the professional literature and book information query, access and finishing skills.** **② Extracurricular Learning：** **Encourage the students to go to the library and on all kinds of domestic and foreign electronic journals and books website.**
8	**With the humanities and social science literacy and professional quality, in the safety engineering practice to understand and abide by professional ethics and norms, to fulfill their responsibilities**	**① The Classroom Teaching：** **Safety System Engineering, Safety management Engineering, Psychology and Behavior Safety, Economic security and insurance, Emergency rescue, Construction Safety, Petroleum Exploration, Mine Safety, Transportation Safety, OSHMS, Safety Legislation.** **② Extracurricular Learning：**

NO.	Training Requirements	Realization Approachs
		Students can improve the safety of the comprehensive ability of applying knowledge through the integrated curriculum of safety engineering design, safety technology curriculum design. Enhance students' understanding of the enterprise safety production management and deepen students' understanding of the practical application of the safety management through production practice, graduation practice.
9	**Ability to work with security expertise and teamwork to take on individual, team members, and responsible roles in a multidisciplinary team**	**Through the safety engineering comprehensive curriculum design, safety technology curriculum design, improve the individual's individual design ability and team collaboration application ability.**
10	**Have effective communication and communication skills, master the report writing, document design, statements and other means of communication on the complex security engineering issues and industry peers and the public to communicate and communicate effectively and respond to social concerns about security issues. And have a certain international perspective, to cross-cultural background to communicate and exchange**	**Through the comprehensive engineering design of safety engineering, safety technology curriculum design, production practice, graduation practice, etc. to improve students in the report writing, document design, presentation and other communication skills to enhance.**
11	**Understand and master the basic safety management knowledge, with enterprise safety management system design capabilities, and has integrated security management and economic decision-making, and can be applied in the interdisciplinary environment**	**① The Classroom Teaching：** **Safety System Engineering, Safety management Engineering, Psychology and Behavior Safety, Economic security and insurance, Emergency rescue, Construction Safety, Petroleum Exploration, Mine Safety, Transportation Safety, OSHMS, Safety Legislation.** **② Extracurricular Learning：** **Students can improve the safety of the comprehensive ability of applying knowledge through the integrated**

NO.	Training Requirements	Realization Approachs
		curriculum of safety engineering design, safety technology curriculum design. Enhance students' understanding of the enterprise safety production management and deepen students' understanding of the practical application of the safety management through production practice, graduation practice.
12	**With independent learning and lifelong learning awareness, have the ability to continue to learn and adapt to development**	**Graduation thesis and graduation design.**

Major Disciplines: Safety Engineering, System Engineering, Mechanics, Industrial Engineering,

Main Courses: Safety system engineering, Ergonomics, Boiler and pressure vessel safety , Industrial Hygiene Engineering, Machinery Safety Engineering, Electrical Safety Engineering, Ventilation and Dust Control, Fire and Explosion Controlling, Safety Management.

Lab Experiments: Ventilation and Dust Control, Electrical Safety Testing, Boiler and pressure vessel testing, Combustion and Explosion Properties Test, Mechanical Properties Test, Industrial Hygiene Testing, Fire and Explosion Controlling, Digital safety.

Practical Work: Cognitive geological practice, teaching practice, productive practice, course project design, graduation practice and design, Bench Work Practice, First Aid, etc.

Duration: four years.

Degree Granted: BS(Bachelor of Science).

Related Specialties: Fire Engineering, Environmental Engineering, Industrial

安全工程专业课程教学计划表

Course Descriptions of Safety Engineering

课程类别 Classi-fication		课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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 Liberal Education Courses	必修 Compulsory	**11706200**	马克思主义基本原理 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 The Essentials of Modern Chinese History	2	32	32						2				
		120001*0	思想道德修养与法律基础 Morality Education and Fundamentals of Law	3	48	48			1.5	1.5						
		113027*0	体育 Physical Education	4	144	144			1	1	1	1				
		109003*0	大学英语 College English	12	192	192			3	3	3	3				
		41904300	C 语言程序设计 B Computer High-level Language B	2.5	40	28	12				2.5					
		20520200	工程导论 Introduction to Civil Engineering	1	16	16			1							
		14300100	军事理论 Military Theory	2	32	32			2							
	选修 Elective	总计 12 学分，含创新创业选修课学分，跨学科选修课不低于 6 学分		12	192											
		小计 Sum		**45.5**	**680**				**11.5**	**5.5**	**10.5**	**6**	**0**	**0**	**0**	**0**
学科基础课 Disciplinary Fundamental Courses		**212028*2**	高等数学 B Advanced Mathematics B	10	160	160			4.0	6.0						
		21207900	线性代数 C Linear Algebra C	2	32	32				2						
		21202202	概率论与数理统计 B Probability and Mathematics Statics B	2.5	40	40							2.5			
		212010*3	大学物理 C College Physics C	6	96	96				3	3					
		212132*1	物理实验 A Physics Experiment A	3.5	56		56			2	1.5					

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
	20302403	大学化学 C College Chemistry C	4	64	50	14			4						
	205080*1	工程力学 A Engineering Mechanic A	9.5	152						5	4.5				
	20520700	流体力学 Fluid mechanics	2.5	40			工程力学 A				2.5				
	20725103	电工与电子技术 C Electrician and Electron C	3	48	40	8					3				
	20714200	工程制图(① 机械制图) Engineering Drawing (①Mechanical Drawing)	2.5	40	40			2.5							
	20706300	机械基础设计 B Fundamentals of Machine Design B	2.5	40	32	8				2.5					
	20723600	金属材料与零件加工 Metallic Materials and Parts Processing	2	32	32			2							
	小计 Sum		**50**	**800**				**8.5**	**17**	**12**	**10**	**2.5**	**0**	**0**	**0**
专业主干课 Main Specialty Courses	**20501200**	安全系统工程 Safety System Engineering	2	32	32							2			
	20500900	安全管理学 Safety management Engineering	2.5	40	40								2.5		
	20501100	安全人机工程 Safety Ergonomics Engineering	2.5	40	32	8						2.5			
	20510300	锅炉压力容器安全 Boiler and pressure vessel safety	2.5	40	32	8							2.5		
	20506200	电气安全工程 Electric Safety Engineering	2.5	40	32	8							2.5		
	20510400	机械安全工程 Mechanical Safety Engineering	2.5	40	32	8						2.5			
	20517000	安全检测与监控技术 Safety detectiong & monitoring	3	48	40	8						3			
	20514300	失效分析 Failure Analysis	2.5	40	32	8						2.5			
	20513600	火灾与爆炸灾害控制 Fire & Explosion Control	2.5	40	32	8						2.5			
	20515700	通风与除尘工程 Fire & Explosion Control	2.5	40	32	8						2.5			
	20534300	环境工程 Environmental Engineering	2	32	24	8							2		
	20534400	传热与传质学 Heat transfer and mass transfer	2	32	24	8					2				
	20535800	安全管理信息技术 Safety management of information technology	2.5	40	20	20								2.5	
	小计 Sum		**31.5**	**504**				**0**	**0**	**0**	**2**	**17.5**	**9.5**	**2.5**	**0**

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
专业选修课 Specialty Elective Courses		具体见专业选修课列表	16.5	264									**9.5**	**7**	
合计 Sub-total			**143.5**	2296				**20**	**22.5**	**22.5**	**18**	**20**	**19**	**9.5**	**0**
实践环节 Practical Work	44300200	军事训练 Military Training	2	2 周				2							
	41904300	计算机课程设计 Course Design for computer	1.5	1.5 周						1.5					
	40707401	金工实习 B Bench Work Practice B	2	2 周					2						
	40500600	安全工程教学实习 Instructive Practice For Safety Engineering	4	4 周							4				
	40500700	安全工程生产实习 Productive Practice for Safety Engineering	4	4 周									4		
	40502100	毕业实习和毕业设计 Practice for Graduate and Bachelor Thesis	16	16 周											16
	40534800	安全检测与监测课程设计 Course Design for Safety detectiong & monitoring	3	3 周								2			
	40534900	风险分析与评估课程设计 Course Design for Risk analysis and evaluation	3	3 周								1			
	40535000	消防工程课程设计 Course Design for Fire Engineering	2	2 周									1		
	40535100	安全技术课程设计 Course Design for Safety technology	4	4 周										4	
	40535200	安全管理体系课程设计	3	3 周									3		
	小计 Sum		**44.5**					**2**	**2**	**1.5**	**4**	**3**	**8**	**4**	**16**
创新创业学习学分 Freedom study	ZZ35S	社会调查 Social Investigation	2												
		其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation)	6												
	小计 Sum		**8**	**0**											

课程类别 Classi-fication	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class 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
总计 Total			**188**	2296+44.5周				**22**	**24.5**	**24**	**22**	**23**	**27**	**13.5**	**16**
可开出专业选修课列表 Specialty Elective Courses	**20501300**	安全心理与行为 Psychology and Behavior Safety	1.5	24	24									1.5	
	20535200	安全经济与工作保险 Economic security and insurance	1.5	24	24									1.5	
	20506400	疲劳与断裂 Fracture and Fatigue	2	32	24	8							2		
	20511100	建筑施工安全 Construction Safety	2	32									2		
	20535400	油气勘探与开发安全 Oil and Gas Exploration and Development Safety	2	32									2		
	20513000	矿山安全 Mine Safety	2	32										2	
	20512100	交通安全 Transportation Safety	2	32										2	
	20535500	化工安全 Chemical Industry Safety	2	32	24	8							2		
	20500400	职业安全健康管理体系 OSHMS	1.5	24	24									1.5	
	20535600	安全法学 Safety Legislation	1.5	24	24									1.5	
	20527900	工程项目管理 Engineering Project Management	2	32	32									2	
	20516200	土木工程概论 Introduction to the construction of underground engineering	2	32	32								2		
	20525100	消防工程 Fire Engineering	2	32	24	8							2		
	小计 Sum		26	416								0	13	11.5	

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。

安全工程专业课程分类统计

	通识教育课程 Liberal Education Courses		学科基础课 Disciplinary Fundamental Courses	专业主干课 Main Specialty Courses	专业选修课 Specialty Elective Courses	实践环节 Practical Work	创新创业自主学习 Freedom Study	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	800/50	504/31.5	264/16.5	44.5 周/44.5	8	2296+44.5周	196
学分所占比例	23.2%		25.5%	16.1%	8.4%	22.7%	4.1%		100%