**资源勘查工程专业培养方案**

**Undergraduate Program of Resources Prospecting Engineering Major**

**Ⅰ.专业介绍 Introduction**

西南交通大学“资源勘查工程”专业于2017年开始首届招生，虽然为我校新开设的本科专业，但在西南交通大学的发展史上，该专业却是一个曾有着辉煌历史的优势学科。在我校成立之初，就于1905年学校设立矿科，开设地质方面课程。1931年设立矿冶系，1938年开设采矿系。直到解放初，我校的“资源勘查工程”专业一直是我校的优势学科之一，百余年来，有多位地质学界的学术泰斗出自于本学科，如何杰院士，王鸿祯院士，袁见齐院士等。在上世纪50年代初高校院系大调整中，以唐山铁道学院（现西南交通大学）矿冶系等为主体新成立北京钢铁学院(北京科技大学的前身)，采矿系调整到新成立的北京地质学院(中国地质大学的前身)和北京矿业学院(中国矿业大学的前身)。1958年，为了适应宝成铁路和成昆铁路的修建，根据铁道部要求学校创办了水文地质与工程地质专业。经过50多年的发展，我校的地质专业已拥有“地质资源与地质工程”一级学科博士学位和硕士学位授权点，拥有“地质资源与地质工程”一级学科博士后流动站，并成为国家级特色专业、国家级卓越工程师教育计划专业，在全国高校地球科学与环境工程学院类专业中具有鲜明特色和重要影响力。2017年，为适应未来新能源、非常规矿产发展的趋势，成立了资源勘查工程本科专业。西南交通大学资源勘查工程专业牢牢抓住“新能源”这一主题，强调“地质过程-成因机理-工程技术”三位一体的学术理念，旨在培养具有深厚地质学基础、数理力学的资源勘查工程专业人才。毕业生主要到国土资源、工矿企业和工程设计院从事与资源勘查工程相关的规划、勘查、开发、工艺改进、科技开发和经营管理等方面的工作。

The “Resources Prospecting Engineering” major of SWJTU started its first enrollment in 2017. Although it is a newly-established undergraduate major in SWJTU, it is a preponderant discipline with a glorious history. At its inception, SWJTU set up the mining department to offer courses in geology in 1905. It set up the mining and metallurgy department in 1931 and the mining engineering department in 1938. Until the beginning of liberation, the major of “Resources Prospecting Engineering” in SWJTU has always been the dominant discipline. For over a century, multiple academic leaders in the field of geology graduated from this discipline, such as Academician He Jie, Academician Wang Hongzhen, Academician Yuan Jianqi, etc. In the great adjustment of departments in colleges and universities in the early 1950s, Beijing Institute of Iron and Steel (predecessor of Beijing University of Science and Technology) was established with Tangshan Railway Institute (now Southwest Jiaotong University) as the main body, and the mining department was included in the newly established Beijing Institute of Geology (predecessor of China University of Geosciences) and Beijing Institute of Mining (predecessor of China University of Mining and Technology). In 1958, in order to adapt to the construction of Baoji-Chengdu Railway and Chengdu-Kunming Railway, SWJTU, according to the requirements of the Ministry of Railways, set up the major of hydrogeology and engineering geology. After over five decades of development, SWJTU now provides first-category “geological resources and geological engineering” discipline for Ph.D. degrees and master's degrees and first-category “geological resources and geological engineering” discipline for postdoctoral research stations. It has also become a national characteristic specialty and a national outstanding engineer education program specialty. Also, its geology major is of distinctive characteristics and important influence in the geology major of colleges and universities nationwide. In 2017, SWJTU set up the undergraduate major of Resources Prospecting Engineering to adapt to the development trend of new energy and unconventional minerals in the future. Centering on the main topic of “new energy”, the Resources Prospecting Engineering major emphasized the trinity academic concept of “geological process-genetic mechanism-engineering technology” and trained Resources Prospecting Engineering professionals with profound geological foundation and mathematical mechanics foundation. Graduates are mainly engaged in planning, exploration, development, process improvement, scientific and technological development and management of resources prospecting projects in Land and Resources System, Industrial and Mining Enterprise and Engineering Design Institute.

专业代码：081403

Program Code: 081403

专业名称：资源勘查工程

Program Name: Resources Prospecting Engineering

**Ⅱ.培养目标 Objectives**

培养适应新时代中国特色社会主义现代化建设需要，德、智、体、美、劳全面发展，具有良好人文社会科学素养、高度社会责任感与高尚工程职业道德；具有扎实专业理论基础与专业技能、较强创新意识、较宽国际视野和跨文化交流、竞争与合作能力，能从事地质矿产基础研究、非常规资源调查-勘查-开发及管理等方面工作的复合型工程技术人才。毕业生主要到资源勘查专业相关的教学、科研和生产部门（如能源、矿业、冶金、建材等领域）从事技术开发与技术管理工作，以及在行政部门从事管理工作。经过五年左右的工作锻炼，毕业生具备资源勘查工程师的实际工作能力，能够胜任生产、科研与工程设计岗位的技术骨干和经营管理岗位。

SWJTU aims to train inter-disciplinary engineering and technical talents who meet the needs of the socialist modernization construction with Chinese characteristics in the new era, gain all-around development of moral, intellectual, physical, aesthetics and labor education, have good humanities and social science literacy, high social responsibility and noble engineering professional ethics; have solid professional theoretical foundation and professional skills, strong sense of innovation, broad international perspective and cross-cultural communication, competition and cooperation capabilities to conduct basic research of geology and mineral resources, unconventional resources investigation-exploration-development and management. Graduates are mainly engaged in technology development and technology management in resources prospecting teaching, scientific research and production departments (such as energy, mining, metallurgy, building materials and other fields), as well as management in administrative departments. After about five years of work, graduates will have the actual working competence of resources prospecting engineers, and can serve in technical backbone and management positions of production, scientific research and engineering design.

**具体目标为：**

**Goals:**

**目标1：**掌握资源勘查工程专业一般性和专门性的技术知识并具备相关技能。

**Goal 1:** mater the general and technical expertise of the resource exploration engineering major and acquire related skills.

**目标2：**具有资源勘查工程专业分析问题与解决问题的能力，并掌握与本专业相关的科研能力和专业能力。

**Goal 2:** obtain issue analyzing and resolving abilities related to the resource exploration engineering major and foster scientific research and professional capabilities related to the major.

**目标3：**掌握资源勘查领域的项目管理基本知识并具备参与工程管理的能力。

**Goal 3:** gain basic knowledge on project management in the sector of resource exploration engineering and develop the abilities to participate in engineering management.

**目标4：**具备持续学习、有效沟通与交流的能力。

**Goal 4：**be able to study continuously and communicate effectively.

**目标5：**具备良好的职业道德，体现对职业、社会的责任。

**Goal 5:** cultivate sound professional ethics with the sense of responsibility for the profession and the society

**III.专业毕业要求 Graduation requirements**

**毕业要求1：**具有扎实的数学、物理科学、力学、化学基础知识，掌握资源勘查的基本理论、方法及基本技能，能用于解决资源勘查及开发过程中的复杂地质及工程问题；

**Requirement 1:** Have solid basic knowledge of mathematics, physics, mechanics and chemistry, master the basic theories, methods and basic skills of resources prospecting, and can be used to solve complex geological and engineering problems in the process of resources prospecting and development;

**毕业要求2：**能够应用数学、自然科学和非常规资源勘查的基本原理，识别、表达、并通过文献研究分析非常规资源勘查中复杂的工程问题，分析矿床成因和矿山开发过程中的复杂地质及工程问题，并获得可靠结论；

**Requirement 2:** Ability to apply the basic principles of mathematics, natural science and unconventional resources prospecting, identify, express, and analyze the complex engineering problems in unconventional resources prospecting through literature research, analyze the genesis of deposits and the complex geology of mine development and Engineering problems and get reliable conclusions；

**毕业要求3：**能够设计针对非常规资源勘查中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）或开采工艺流程，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；

**Requirement 3:** be able to design innovative solutions to complicated issues in non-conventional resource exploration projects and to design systems, units (components) or mining process that meet specific requirements, with social, healthy, safety, legal, cultural and environmental factors taken into consideration;

**毕业要求4：**能够基于科学原理并采用科学方法对非常规资源勘查中复杂工程问题进行研究，包括设计实验、分析与解释数据、并通过信息科学与技术学院综合得到合理有效的结论；

**Requirement 4:** be able to study complicated engineering issues in non-conventional resource exploration projects based on scientific principles with proper methods, including experiment design, data analysis and interpretation as well as conclusion drawing based on acquired information;

**毕业要求5：**能够针对非常规资源勘查中的复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具和信息科学与技术学院技术工具，包括对复杂工程问题的预测与模拟，并能够理解其局限性；

**Requirement 5:** be able to develop, choose and employ proper techniques, resources, modern engineering tools as well as information and technology tools to anticipate and simulate complicated engineering issues in non-conventional resource exploration projects and understand the limitations of such techniques, resources and tools;

**毕业要求6：**能够基于非常规资源勘查工程相关背景知识进行合理分析，评价非常规资源勘查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；

**Requirement 6:** be able to make proper analysis based on the knowledge about non-conventional resource exploration engineering projects, assess the social, healthy, safety, legal and cultural implications of non-conventional resource exploration practices and solutions to complicated engineering issues, and understand related responsibilities to be assumed;

**毕业要求7：**能够理解和评价针对非常规资源勘查中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；

**Requirement 7:** be able to understand and assess the impact of professional engineering practices to solve complicated engineering issues in non-conventional resource exploration engineering projects on the environment and sustainable social development;

**毕业要求8：**具有人文社会科学素养、社会责任感，能够在非常规资源勘查工程实践中理解并遵守工程职业道德和规范，履行责任；

**Requirement 8:** be with humanistic and social science literacy and sense of social responsibility and able to understand and comply with engineering professional ethics and norms as well as fulfill duties in non-conventional resource exploration engineering practices;

**毕业要求9：**具有较强的团队意识和协作精神，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。

**Requirement 9:** be with excellent teamwork and collaborative spirits and able to work independently, in team or as the project lead in the team with multi-disciplinary background;

**毕业要求10：**能够就非常规资源勘查中复杂工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流；

**Requirement 10:** be able to communicate with industrial peers and the public over complicated issues in non-conventional resource exploration engineering projects by writing reports, preparing design drafts, making speeches, expressing or responding clearly;

**毕业要求11：**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；

**Requirement 11:** understand and master project management principles and economic decision methods and apply them in multi-disciplinary scenarios;

**毕业要求12：**具有健康的体魄和良好的心理素质；具备终身获取新知识的意识，有不断学习和适应发展的能力。

**Requirement 12:** be healthy physically and psychologically with the pursuit to acquire new knowledge throughout life supported by continuous learning and development abilities.

**IV.学制与学位 Duration and Degree**

学制：4

Duration: 4

学位：工学学士

Degree: Bachelor of Engineering

**V.主干学科与主干课程 Main Subject and Main Course**

**主干学科：**资源勘查工程

**Main Subject**：Resources Prospecting Engineering

**主干课程：**普通地质学、结晶学与矿物学、岩石学、构造地质学、矿床学、矿石矿相学、矿产勘查学、非常规资源学、地球物理勘探、地球化学

**Main Course：**Physical Geology，Crystallography and Mineralogy，Petrology，Structural Geology，Deposits，Ore mineralogy，Exploration geochemistry，Unconventional resource science，Geophysical Exploration，geochemistry.

**Ⅳ.毕业学分基本要求 Basic Requirements of Credits for Graduation**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **课程体系**  **Curriculum System** | | **学分要求**  **Credits Requirements** | | | | | | |
| **必修**  **Compulsory** | | **限修** **Distributional Electives** | | **选修**  **Free Electives** | | **小计**  **Subtotal** |
| **理论  Theory** | **实践  Practice** | **理论  Theory** | **实践  Practice** | **理论  Theory** | **实践  Practice** |
| **公共基础课程  Public Basic Courses** | 思想政治类  Ideological Politics Courses | 14 | 2 |  |  |  |  | 16 |
| 军事类  Military Courses | 2 | 2 |  |  |  |  | 4 |
| 外语类  Foreign Language Courses | 6 |  | 2 |  |  |  | 8 |
| 体育类  Physical Education Courses |  | 4 |  |  |  |  | 4 |
| **通识教育课程**  **General Education Courses** | 核心通识课  Core General Education Courses |  |  | 4 |  |  |  | 4 |
| 新生研讨课  Freshman Seminar | 2 |  |  |  |  |  | 2 |
| **学科与专业基础课程 （含实验） Discipline and Specialty Foundational Courses（Including Experiments）** | 数学与自然科学基础课  Foundational Courses on Mathematics and Natural Science | 29 | 4 |  |  |  |  | 33 |
| 专业基础课  Professional Foundational Courses | 34 | 14 |  |  |  |  | 48 |
| **专业课程 （含实验） Specialized Courses（Including Experiments）** | 专业核心课程  Specialized Core Course | 14 | 6 |  |  |  |  | 20 |
| 专业限修课程  Specialized Restricted Courses |  |  | 1.5 | 0.5 |  |  | 2 |
| **实习实践教学 Practice Courses** | 基本技能训练、实习实训、综合课程设计、社会与文化素质实践、毕业实习与毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and Cultural Quality Practice, Graduation Internship and Graduation Design |  | 13 |  |  |  |  | 13 |
| **多元化课程**  **Diversified Courses** | 跨学科课程、美育专业类课程、学科竞赛类课程、其它个性化选修课程等  Interdisciplinary  Courses, Aesthetic Education Courses, Subject Competition Courses, other Personalized Elective Courses，etc |  |  | 4 |  |  |  | 4 |
| **创新创业实践**  **Innovation and Entrepreneurship Practice** | 创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等  Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc |  | 2 |  |  |  |  | 2 |
| **必修环节**  **A Compulsory Part** | 大学生综合素质提升、学生体质达标测评  Comprehensive Quality Improvement Courses for College Students, Assessment of Students' Physical Fitness |  |  |  |  |  |  | 0 |
| **总 计**  **Total** | | | | | | | | **160** |

**Ⅴ.课程设置细化表 Course Programs Table**

(Ⅰ)课程设置 Course Programs

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **公共基础课程**  **Public Basic Courses**  共32学分，其中必修30学分，限修2学分，选修0 学分  A total credits of 32，including 30 for compulsory courses，2 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class Practice Credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **思想政治类 Ideological Politics Courses** | 思想道德修养与法律基础  The Ideological and Moral Cultivation and Legal Basis | 必修Compulsory | 3 | 0.4 | 第1学期  1St Semester | 马克思主义学院  School of Marxism | 6.2,7.1,8.2,12.2 |  |
| 中国近现代史纲要  Conspectus of Chinese Modern History | 必修Compulsory | 3 | 0.4 | 第2学期  2Nd Semester | 马克思主义学院  School of Marxism | 8.1 |  |
| 马克思主义基本原理  The Basic Principles of Marxism | 必修Compulsory | 3 | 0.4 | 第3学期  3Rd Semester | 马克思主义学院  School of Marxism | 8.1 |  |
| 毛泽东思想和中国特色社会主义理论体系概论 I  Introduction to Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics I | 必修Compulsory | 3 | 0.4 | 第5学期  5 Th Semester | 马克思主义学院  School of Marxism | 8.1 |  |
| 毛泽东思想和中国特色社会主义理论体系概论II  Introduction to Mao Zedong Thought and theoretical System of Socialism with Chinese Characteristics II | 必修Compulsory | 2 | 0.4 | 第6学期  6Th Semester | 马克思主义学院  School of Marxism | 8.1 |  |
| 形势与政策I  Situation and Policy I | 必修Compulsory | 0 | 0 | 第1学期  1St Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅱ  Situation and Policy Ⅱ | 必修Compulsory | 0 | 0 | 第2学期  2Nd Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅲ  Situation and Policy Ⅲ | 必修Compulsory | 0 | 0 | 第3学期  3Rd Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅳ  Situation and Policy Ⅳ | 必修Compulsory | 0 | 0 | 第4学期  4Th Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策V  Situation and Policy V | 必修Compulsory | 0 | 0 | 第5学期  5Th Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅵ  Situation and Policy Ⅵ | 必修Compulsory | 0 | 0 | 第6学期  6Th Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅶ  Situation and Policy Ⅶ | 必修Compulsory | 0 | 0 | 第7学期  7Th Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| 形势与政策Ⅷ  Situation and Policy Ⅷ | 必修Compulsory | 2 | 0 | 第8学期  8Th Semester | 马克思主义学院  School of Marxism | 6.2 |  |
| **军事类**  **Military Courses** | 军事理论  Military Theories | 必修Compulsory | 2 | 0 | 第1学期  1St Semester | 武装部 Security Office | 6.1 |  |
| 军事技能  Military Skills | 必修Compulsory | 2 | 2 | 短1学期  Short Semester 1 | 武装部 Security Office | 8.2,9.1,12.2 |  |
| **外语类**  **Foreign Language Courses** | 英语I  College English I | 必修Compulsory | 2 | 0 | 第1学期  1St Semester | 外国语学院  School of Foreign languages | 10.3 |  |
| 英语II  College English II | 必修Compulsory | 2 | 0 | 第2学期  2Nd Semester | 外国语学院  School of Foreign languages | 10.3 |  |
| **外语类**  **Foreign Language Courses** | 通用学术英语  English for General Academic Purposes | 必修Compulsory | 2 | 0 | 第3学期  3Rd Semester | 外国语学院  School of Foreign languages | 10.3 |  |
| 职场英语  Workplace English | 限修Distributional Elective | 2 | 0 | 第4学期  4Th Semester | 外国语学院  School of Foreign languages | 10.3,12.1 | 限选1门，2学分  Limited to  1 course,  2 credits |
| 交际与文化视听说  Viewing, Listening & Speaking in English --Communication & Culture |
| 语言、文化与翻译  Language, Culture and Translation |
| 英语公共演讲  Public Speaking in English |
| **体育类**  **Physical Education Courses** | 体育I  Physical Education I | 必修Compulsory | 1 | 1 | 第1学期  1St Semester | 体育部Dept. of Physical Education | 9.1,12.2 |  |
| 体育Ⅱ  Physical Education Ⅱ | 必修Compulsory | 1 | 1 | 第2学期  2Nd Semester | 体育部Dept. of Physical Education |
| 体育Ⅲ  Physical Education Ⅲ | 必修Compulsory | 0.5 | 0.5 | 第3学期  3Rd Semester | 体育部Dept. of Physical Education |
| 体育Ⅳ  Physical Education Ⅳ | 必修Compulsory | 0.5 | 0.5 | 第4学期  4Th Semester | 体育部Dept. of Physical Education |
| 体育健康课程I  Diversified Physical Education Courses I | 必修Compulsory | 0.5 | 0.5 | 第5学期  5Th Semester | 体育部Dept. of Physical Education |
| 体育健康课程II  Diversified Physical Education Courses II | 必修Compulsory | 0.5 | 0.5 | 第6学期  6Th Semester | 体育部Dept. of Physical Education |
| **通识教育课程**  **General Education Courses**  共6学分，其中必修2学分，限修4学分，选修0学分  A total credits of 6，including 2 for compulsory courses，4 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **核心通识课**  **Core General Education** | “交通天下”通识课程  General Studies on Transportation | 限修Distributional Elective | 4 |  | 2-8学期  2-8  Semester | 全校  The whole school | 6.1,6.3 |  |
| **新生研讨课**  **Freshman Seminar** | 地质资源与地质工程概论  Introduction to Geological Resources and Geological Engineering | 必修Compulsory | 2 |  | 第1学期  1St Semester | 地球科学与环境工程学院  Faculty of Geosciences and Environmental Engineering | 6.1,6.3 |  |
| **学科与专业基础课程 （含实验）**  **Discipline and Specialty foundational Courses（Including Experiments）**  共81学分，其中必修81学分，限修0学分，选修0学分  A total credits of 81，including 81 for compulsory courses，0 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **数学与自然科学基础课**  **Foundational Courses on Mathematics and Natural Science** | 高等数学I  Higher Mathematics I | 必修  Compulsory | 5 |  | 第1学期  1St Semester | 数学学院  School of Mathematics | 1.1 |  |
| 高等数学II  Higher Mathematics II | 必修  Compulsory | 5 |  | 第2学期  2Nd Semester | 数学学院  School of Mathematics | 1.1 |  |
| 线性代数A  Linear Algebra A | 必修  Compulsory | 4 |  | 第1学期1St Semester | 数学学院  School of Mathematics | 1.1,2.1,11.1 |  |
| 概率论与数理统计  Probability and Statistics | 必修  Compulsory | 3 |  | 第4学期  4Th Semester | 数学学院  School of Mathematics | 1.1,2.1, 11.1 |  |
| **数学与自然科学基础课**  **Foundational Courses on Mathematics and Natural Science** | 大学物理AⅠ  College Physics AI | 必修  Compulsory | 4 |  | 第2学期2Nd Semester | 物理科学与技术学院  School of Physical Science and Technology | 1.2 |  |
| 大学物理实验I  Experiment in College physics I | 必修  Compulsory | 1 | 1 | 第2学期2Nd Semester | 物理科学与技术学院  School of Physical Science and Technology | 1.2 |  |
| 大学物理AII  College Physics AII | 必修  Compulsory | 4 |  | 第3学期3Rd Semester | 物理科学与技术学院  School of Physical Science and Technology | 1.2 |  |
| 大学物理实验II  Experiment in College physics II | 必修  Compulsory | 1 | 1 | 第3学期3Rd Semester | 物理科学与技术学院  School of Physical Science and Technology | 1.2 |  |
| 计算机程序设计基础  Introduction to Program | 必修  Compulsory | 3 | 1 | 第2学期  2Nd Semester | 信息科学与技术学院  School of Information science and technology | 5.2,12.1 |  |
| 工程化学 A  Engineering Chemistry A | 必修  Compulsory | 3 | 1 | 第1学期  1St Semester | 生命科学与工程学院  School of Life Science and Engineering | 1.3 |  |
| **专业基础课**  **Professional Foundational Courses** | 工程制图及计算机绘图  Engineering Drafting and computer Drafting | 必修  Compulsory | 3 | 1 | 第3学期  3Nd Semester | 土木工程学院  School of Civil Engineering | 3.3, 5.2 |  |
| 材料力学B  Mechanics of Materials B | 必修  Compulsory | 4 | 1 | 第4学期  4Th Semester | 力学与工程学院  School of Mechanics and Engineering | 1.4 |  |
| 理论力学B  Theoretical Mechanics B | 必修  Compulsory | 4 | 1 | 第3学期  3Nd Semester | 力学与工程学院  School of Mechanics and Engineering | 1.4 |  |
| 工程测量 B  Engineering surveying B | 必修  Compulsory | 3 | 1 | 第2学期  2Nd Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 3.3 |  |
| 普通地质学(含实验）  Physical Geology | 必修  Compulsory | 3 | 1 | 第2学期  2Nd Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 1.5, 7.1 |  |
| 结构力学D  Structural Mechanics D | 必修  Compulsory | 4 |  | 第5学期  5Th Semester | 土木工程学院  School of Civil Engineering | 1.4 |  |
| 晶体光学及光性矿物学Crystal optics and optical mineralogy | 必修  Compulsory | 2 | 1 | 第3学期3Rd Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 1.5,3.1,4.1 |  |
| 结晶学与矿物学  Crystallography and Mineralogy | 必修  Compulsory | 3 | 1 | 第3学期  3 Rd  Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 1.5,3.1,4.1 |  |
| 构造地质学B  Structural Geology B | 必修  Compulsory | 5 | 2 | 第4学期  4Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 1.5,4.1,10.1 |  |
| **专业基础课**  **Professional Foundational Courses** | 岩石学  Petrology | 必修  Compulsory | 4 | 1 | 第4学期  4Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 1.5,3.1,4.1 |  |
| 水文地质学基础A  Introduction to Hydrogeology A | 必修  Compulsory | 3 | 1 | 第6学期  6Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.4,4.3,5.1,7.2 |  |
| 古生物地层学  Palaeontology Stratigraphy | 必修  Compulsory | 3 | 1 | 第5学期  5Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 4.1 |  |
| 地球物理勘探  Geophysical Exploration | 必修  Compulsory | 4 | 1 | 第6学期  6Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.3,3.1,4.2,5.1 |  |
| 地球化学  geochemistry | 必修  Compulsory | 3 | 1 | 第5学期  5Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.4,4.3 |  |
| **专业课程 （含实验）**  **Specialized Courses（Including Experiments）**  共22学分，其中必修20学分，限修2学分，选修0学分  A total credits of 22，including 20 for compulsory courses，2 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **专业核心课程**  **Specialized Core Course** | 矿床学  Deposits | 必修  Compulsory | 4 | 1 | 第5学期  5Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.2 |  |
| 矿石矿相学  Ore mineralogy | 必修  Compulsory | 3 | 1 | 第5学期  5Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.2,3.1,5.1 |  |
| 矿产勘查学  Mineral exploration | 必修  Compulsory | 3 | 1 | 第6学期  6Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.2 |  |
| 勘查地球化学  Exploration geochemistry | 必修  Compulsory | 2 | 1 | 第6学期  6Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.3,3.4,4.2,7.2 |  |
| 矿产资源经济学  Economics of mineral resources | 必修  Compulsory | 2 | 0.5 | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.3,5.1 |  |
| **专业核心课程**  **Specialized Core Course** | 非常规资源学  Unconventional resource science | 必修  Compulsory | 4 | 1 | 第6学期  6Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 3.3 |  |
| 专业外语（地质）  Special English in Geological Engineering | 必修  Compulsory | 2 | 0.5 | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 10.3 |  |
| **专业限修课程**  **Specialized Restricted Courses** | 遥感地质学  Remote Sensing Geology | 限修Distributional Elective | 2 | 0.5 | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.4 | 限选1门，2学分Limited to 1 course, 2 credits |
| 环境科学与工程概论  Introduction to Environmental Engineering | 2 | 0.5 | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering |
| **实习实践教学**  **Practice Course**  共13学分，其中必修13学分，限修0学分，选修0学分  A total credits of 13，including 13 for compulsory courses，0 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **基本技能训练、实习实训、综合课程设计、社会与文化素质实践、毕业实习与毕业设计 Basic Skills Training, Practical Training, Integrated Curriculum Design, Social and**  **Cultural Quality Practice, Graduation Internship and Graduation Design** | 普通地质实习  Practice of Physical Geology | 必修  Compulsory | 2 | 2 | 短1学期  Short Semester 1 | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 3.2,9.1,10.2 |  |
| 工程测量实习 B  Practice of Engineering Survey B | 必修  Compulsory | 1 | 1 | 短 1学期  Short Semester 1 | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 3.2,10.1 |  |
| 地质测绘实习  Practice of Geological Survey | 必修  Compulsory | 3 | 3 | 短 2学期  Short Semester 2 | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.5,3.2,3.4,9.2,10.1 |  |
| 资源勘查综合实习Practice of Resources Prospecting Engineering | 必修  Compulsory | 3 | 3 | 短 3学期  Short Semester 3 | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.5,5.2,9.2,10.2,11.2 |  |
| 毕业设计（论文）  Graduation Practice graduation Design | 必修  Compulsory | 4 | 4 | 第8学期  8Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 2.5,6.3,8.2,10.2,11.2 |  |
| **多元化课程**  **Diversified course**  共4学分，其中必修0学分，限修4学分，选修0学分  A total credits of 4，including 0 for compulsory courses，4 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **美育专业类课程 Aesthetic Education Courses** | 地质素描基础  Introduction to Sketch of Geology | 限修4学分  Limited  4 Credits | 2 |  | 第7学期  7Th Semester | 建筑与设计学院  School of Architecture and Design | 6.1,7.1 | 按照《西南交通大学多元化课程修读指导手册》执行。  Follow the 《Instruction manual of diversified courses of southwest Jiaotong University》 |
| **跨学科课程**  **Interdisciplinary Courses** | 工程项目管理  Project Management | 2 |  | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering |
| 工程伦理学  Engineering Ethics | 2 |  | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering |
| 轨道交通概论  Introduction to Rail transportation | 2 |  | 第7学期  7Th Semester | 交通运输与物流学院  School of Transportation and Logistics |
| 地学思考  Thinking in Geology | 2 |  | 第7学期  7Th Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering |
| **创新创业实践**  **Innovation and Entrepreneurship Practice**  共2学分，其中必修2学分，限修0学分，选修0学分  A total credits of 2，including 2 for compulsory courses，0 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **创新创业训练计划项目、个性化实验、学科竞赛、创新讲座等**  **Innovation and Entrepreneurship Training Program, Personalized Experiments, Subject Competition, Innovation Lectures, etc** | 课外创新实践  Extracurricular Innovation  Practice | 必修Compulsory | 2 | 2 | 3-7学期  3-7  Semester | 地球与环境工程学院  Faculty of Geosciences and Environmental Engineering | 4.3,9.2 | 按照《西南交通大学创新实践学分认定与管理办法》规定执行  By Credit Recognition and Management of Innovative Practice in Southwest Jiaotong University |
| **必修环节**  **A compulsory part**  共0学分，其中必修0学分，限修0学分，选修0学分  A total credits of 0，including 0 for compulsory courses，0 for distributional electives and 0 for free electives | | | | | | | | |
| **课程类型**  **Course Type** | **课程名称**  **Course Name** | **课程性质**  **Nature of Course** | **总学分**  **Credits** | **课内实践学分**  **In-class practice credits** | **开课学期**  **Semester** | **开课学院**  **School** | **支撑毕业要求指标点 Indicators which Support Graduation Requirements** | **备注**  **Notes** |
| **大学生综合素质提升、学生体质达标测评**  **Comprehensive Quality Improvement Courses for College Students, Assessment of Students' Physical Fitness** | 大学生综合素质提升（第二、第三课堂）  Comprehensive Quality Improvement Courses for College Students（The Second and Third Classroom） | 必修Compulsory | 0 | 0 | 1-8学期  1-8 Semester | 校团委  Communist Youth League Committee | 6.1,7.1 |  |
| 学生体质达标测评  Assessment of Students' Physical Fitness | 必修Compulsory | 0 | 0 | 秋季学期  fall Semester | 体育部Dept. of Physical Education | 9.1 |  |
| **学分总计**  **Total Credits** | | | **160** | | | | | |