|  |  |  |  |
| --- | --- | --- | --- |
| 院教学指导委员主任（院长） | 学院分管教学副院长 | 审核人（专业责任教授负责人） | 执笔人 |
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**2020级安全工程专业培养方案**

**Curriculum for Undergraduate of Safety Engineering Major**

**一、培养目标**

培养能适应社会主义现代化建设和社会经济发展需要，德、智、体、美、劳全面发展，掌握安全科学、安全工程及技术的基础理论和专业知识，获得安全工程师的基本训练，具备在金属矿山和冶金制造等领域从事安全系统设计和研究、安全技术咨询、安全教育培训、安全管理与监察等方面的工作能力，具有创新创业精神和国际视野，能够适应我国工业安全转型升级要求的高素质应用型人才。

本专业毕业生毕业五年之后预计能达到以下目标：

（1）具有良好的道德修养、职业伦理，身心健康，积极服务于国家和社会，成为社会主义事业建设者和接班人；

（2）具备注册安全工程师的基本素质和能力，能在金属矿山开采和冶金制造等领域进行安全技术开发研究、安全工程设计、安全评价和企业安全管理等职业活动，成为业务骨干或技术负责人；

（3）具备良好的沟通、协调和领导能力，具有良好的国际视野，能在多学科、多文化背景下的安全工程项目管理团队中担任负责人；

（4）能够持续关注安全科学和技术的前沿动态、应急管理的发展趋势，适应工业安全中对智能化和数字化的要求，具备终身学习的能力，在安全工程领域具有职场竞争力。

**I.Training** **objectives**

This major educated high quality applied talents can satisfy the need of socialist market economy construction, develop comprehensively in morality, intelligence and physique etc., master the basic theory and professional knowledge of safety science, safety engineering and technology, acquire fundamental training as a safety engineer, be capable of safety system design, safety technical consultation, safety education, safety management and supervision in metal mines and metallurgical manufacturing, possess innovation and entrepreneurship and international view, and adapt to the transformation and upgrading of industrial safety.

Graduates of this major are supposed to achieve the following aims after five years:

1. Possessing good moral cultivation, professional ethics and healthy physical and mental, being active service to the country and society, and to become a builder and successor of the socialist cause;

2. Mastering the fundamental quality and ability of certified safety engineer, being capable of safety technology development, safety engineering design, safety evaluation and enterprise safety management in metal mines and metallurgical manufacturing, and to become a business backbone or technical leader;

3. Having well communication, coordination and leadership ability, with good international view, and to become a core leader in a multi-disciplinary and multi-cultural safety engineering project;

4. Paying attention to the cutting-edge dynamics of safety science and technology and the development trend of emergency management continuously, adapting to the requirements of intelligent and digital industrial safety, having the sense of lifelong learning, and to be occupational competitive in the field of safety engineering.

**二、毕业要求**

（1）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金属矿山和冶金制造等领域的复杂安全工程问题。

（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金属矿山开采和冶金制造等工业过程中的复杂安全工程问题，以获得有效结论。

（3）设计/开发解决方案：能够针对金属矿山开采和冶金制造过程中的机械安全、通风除尘和建筑防火等复杂工程进行规划和方案设计，并能够在规划、设计环节体现创新意识，考虑社会、健康、经济、法律、文化以及环境等因素。

（4）研究：能够基于安全工程学科的基本原理并采用科学的方法对复杂安全工程问题进行研究，具有设计实验、分析与解释数据，并融合数据智能处理技术得到合理有效结论的能力。

（5）现代工具的应用：能够应用计算机程序对工程进行辅助设计，应用安全模拟仿真理论和技术对安全工程及相关领域的复杂工程问题进行分析、预测和模拟，并能够理解其局限性。

（6）工程与社会：能够基于安全工程相关知识进行合理分析，评价生产、建设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）环境和可持续发展：能够理解和评价复杂生产过程和建设工程实践对环境、社会可持续发展的影响。

（8）职业规范：树立和践行社会主义核心价值观，具有推动社会主义事业建设的责任感和使命感，具有人文社会科学素养、社会责任感，能够在安全工程实践中理解并遵守工程职业道德和规范，履行责任。

（9）个人与团队：能够在多学科背景下的团队中承担团队成员以及负责人的角色。

（10）沟通：能够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，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：理解并掌握建设施工和工业生产中的安全管理原理和相关的经济决策方法，并能在多学科环境中应用。

（12）终身学习：能够持续关注国内外工业安全及相关领域的前沿动态和发展趋势，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。

**II.Requirements**

1. Engineering knowledge: With the ability of using mathematics, natural sciences, basic and professional knowledge in engineering to solve complex engineering problems in the field of safety engineering.

2. Problem analysis: Identifying, expressing, and analyzing the complex engineering problems in safety engineering area with the literature research methods to obtain effective conclusions, basing on the application of basic principles of mathematics, natural sciences and engineering science.

3. Design / develop solutions: Providing solutions solve the complex problems in the field of safety engineering. Designing systems, units (components) or processes meet specific needs. With the ability of embodying innovation awareness as well as the factors of society, health, safety, law, culture, environment, etc, in the designing process.

4. Experimental design and information processing: Researching complex engineering problems in the field of safety engineering by scientific methods based on scientific principles, including experiments designing, data analysis and interpretation, to obtain reasonable and effective conclusions through comprehensive information analysis.

5. Using modern tools: With the ability of developing, selecting and using appropriate technologies, resources, modern engineering tools, information technology tools to solve complex engineering issues in the field of safety engineering, including the prediction and simulation of complex engineering problems and understanding its limitation.

6. Engineers’ sense of social responsibility: With the ability of making reasonable analysis based on the relevant engineering background, to evaluate the impact of the engineering practice and complex engineering solutions in the field of safety engineering on society, health, safety, legal and culture as well as understanding the corresponding responsibility.

7. Environment and sustainable development: With the ability of understanding and evaluating the impact of safety engineering and related professional engineering practices of complex engineering problems on the environmental and social sustainable development.

8. Professional ethics and norms：With high sense of humanities and social science literacy, social responsibility, understanding and observing engineering ethics and norms in safety engineering and related engineering practice.

9. Individual and team：Be able to play a role as a team member or a team manager in multi-disciplinary environment.

10. Communication：Be able to communicate effectively with industry peers and the public on complex engineering issues in the field of safety engineering, including writing reports, designing documents, presenting statements, clearly expressing or responding to directives. Communicating and exchanging ideas within the cross-cultural background with international perspective.

11. Project management：With the ability of understanding and mastering the management principles and economic decision-making methods in the field of safety engineering, and be able to apply them in multi-disciplinary environment.

12.Lifelong time learning：With the sense of independent learning and lifelong time learning awareness, as well as the continuous learning and development adaptive ability.

**表1 培养目标实现矩阵**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 培养目标1 | 培养目标2 | 培养目标3 | 培养目标4 |
| 毕业要求1 |  | √ |  |  |
| 毕业要求2 |  | √ |  |  |
| 毕业要求3 |  | √ |  |  |
| 毕业要求4 |  | √ |  | √ |
| 毕业要求5 |  | √ |  | √ |
| 毕业要求6 | √ |  |  |  |
| 毕业要求7 | √ |  |  |  |
| 毕业要求8 | √ |  |  |  |
| 毕业要求9 |  |  | √ |  |
| 毕业要求10 |  |  | √ |  |
| 毕业要求11 |  |  | √ |  |
| 毕业要求12 |  |  |  | √ |

**表2 毕业要求与观测指标点**

|  |  |
| --- | --- |
| 1. 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金属矿山和冶金制造等领域的复杂安全工程问题。 | 1-1：掌握所需的数学知识，能针对具体的安全工程问题建立数学模型并求解。 |
| 1-2：能将物理、化学等自然科学知识用于安全工程问题及事故致因的阐析。 |
| 1-3：掌能够将安全工程基础知识和技术用于推演、分析复杂工程问题。 |
| 1-4：综合应用所学工程知识，用于金属矿山和冶金制造等领域的复杂安全工程问题解决方案的比较和综合。 |
| 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金属矿山开采和冶金制造等工业过程中的复杂安全工程问题，以获得有效结论。 | 2-1：能够应用数学和自然科学基本方法，将金属矿山开采和冶金制造过程中的复杂工程问题转化为数学和力学问题进行表述、分析。 |
| 2-2：能够利用专业知识识别和判断复杂安全工程问题的关键环节。 |
| 2-3：在实践教学中，面对复杂安全工程问题能提出多种解决方案。 |
| 2-4：具备通过文献研究分析和判断复杂安全工程问题并获得有效结论的能力。 |
| 3. 设计/开发解决方案：能够针对金属矿山开采和冶金制造过程中的机械安全、通风除尘和建筑防火等复杂工程进行规划和方案设计，并能够在规划、设计环节体现创新意识，考虑社会、健康、经济、法律、文化以及环境等因素。 | 3-1：掌握矿山安全、通风除尘、防火防爆工程、职业危害控制工程的设计流程和技术方法，了解影响设计目标和技术方案的各种因素。 |
| 3-2：能够完成机械安全、通风除尘和建筑防火等工程单元设计，在设计中体现创新意识。 |
| 3-3：具有安全工程实践学习的经历，在规划和设计中能够独立提出方案、完成报告，同时具有进行创新性规划和设计的能力。 |
| 3-4：了解并掌握企业生产和施工建设中的社会、健康、安全、法律、文化以及环境等多方面要求，在安全工程规划和设计中得到满足。 |
| 4. 研究：能够基于安全工程学科的基本原理并采用科学的方法对复杂安全工程问题进行研究，具有设计实验、分析与解释数据，并融合数据智能处理技术得到合理有效结论的能力。 | 4-1：熟练掌握主要安全测试和实验仪器的知识、理论、原理及使用技能。 |
| 4-2：能够基于安全科学原理与方法，针对复杂安全工程问题，设计实验方案，并开展实验研究，获取实验数据。 |
| 4-3：应用数理方法、数据智能处理技术等分析及解读数据，通过信息综合得到合理有效的结论。 |
| 5. 现代工具的应用：能够应用计算机程序对工程进行辅助设计，应用安全模拟仿真理论和技术对安全工程及相关领域的复杂工程问题进行分析、预测和模拟，并能够理解其局限性。 | 5-1：掌握计算机辅助设计相关软件，并能熟练应用于相关工程设计。 |
| 5-2：掌握火灾和烟气模拟仿真技术，能对安全工程领域相关问题进行模拟、预测和优化，并能够理解其局限性。 |
| 5-3：了解现代数据分析方法，能使用相关数据处理软件分析和优化复杂工程问题，并能够理解其局限性。 |
| 6. 工程与社会：能够基于安全工程相关知识进行合理分析、评价生产、建设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。 | 6-1：具备从事安全评价的能力，熟练掌握安全生产相关法律法规、风险辨识与评估、风险控制的方法与理论。 |
| 6-2：能运用相关知识分析和评价生产、建设工程实践和复杂工程问题解决方案对社会、健康、安全以及文化的影响，并理解应承担的责任。 |
| 7. 环境和可持续发展：能够理解和评价复杂生产过程和建设工程实践对环境、社会可持续发展的影响。 | 7-1：具有强烈的安全环保意识和社会责任感，知晓和理解生产过程和建设工程对环境、社会可持续发展的影响。 |
| 7-2：具备评价生产过程和建设项目对环境、社会可持续发展影响的能力。 |
| 8. 职业规范：树立和践行社会主义核心价值观，具有推动社会主义事业建设的责任感和使命感，具有人文社会科学素养、社会责任感，能够在安全工程实践中理解并遵守工程职业道德和规范，履行责任。 | 8-1：具有人文社会科学素养、思辨能力和科学精神，身心健康。 |
| 8-2：树立和践行社会主义核心价值观，理解个人与社会的关系，了解国情，掌握基本的军事知识和技能，具有推动社会主义事业建设的责任感和使命感。 |
| 8-3：理解诚实、公正、守信的职业道德，具有较高的安全职业素养，能够在安全工程及相关工程实践中遵守工程职业规范，履行责任。 |
| 9. 个人与团队：能够在多学科背景下的团队中承担团队成员以及负责人的角色。 | 9-1：具备团队意识和合作精神。 |
| 9-2：能够根据自身作为团队成员或团队负责人的不同角色，做好本职工作，发挥个体在团队中作用。 |
| 10. 沟通：能够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，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。 | 10-1：具备就安全工程领域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的能力。 |
| 10-2：能够进行安全工程研究分析报告、设计文稿和公务文等文件的撰写。 |
| 10-3：能熟练应用至少一门外语，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：理解并掌握建设施工和工业生产中的安全管理原理和相关的经济决策方法，并能在多学科环境中应用。 | 11-1：掌握工程项目管理的方法和原理，具备建设工程及相关工程施工安全监理和决策的能力。 |
| 11-2：了解工程项目和工业产品生产的全周期、全流程中与安全相关的经济决策问题。 |
| 11-3：能将安全管理原理与经济决策方法在金属矿山和冶金制造的安全工程问题中应用。 |
| 12. 终身学习：能够持续关注国内外工业安全及相关领域的前沿动态和发展趋势，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。 | 12-1：具有自主学习和终身学习的意识。 |
| 12-2：通过不断自主学习，具备适应工业智能化和数字化发展要求的能力。 |

**三、专业主干课程**

安全管理、安全系统工程、流体力学泵与风机、工程热力学与传热学、建筑火灾安全工程、建筑施工安全技术、防火防爆安全技术、锅炉压力容器安全技术、电气安全工程、岩土力学、工业通风、职业危害与控制。

**III．Core courses**

Safety Management, Safety System Engineering, Fluid Mechanics / Pump and Fan, Engineering Thermodynamics and Heat Transfer, Building Fire Safety Engineering, Building Construction Safety Technology, Fire Prevention and Explosion Protection Technologies, Boiler and Pressure Vessel Safety Technology, Electrical Safety Engineering, Geomechanics, Industrial Ventilation, Occupational Hazards and Control.

**四、基本学制：四年**

**IV. Recommended length of the program:** **4 years**

**五、授予学位：工学学士**

**V. Degree: Bachelor of Engineering**

学生修满所规定的最低毕业学分，符合武汉科技大学授予学士学位规定，授予工学学士学位。

1. **毕业学分要求：176学分**

|  |  |  |  |
| --- | --- | --- | --- |
| 课程类型 | 学分要求 | 课程类型 | 学分要求 |
| 1、公共课程平台 | 48 | 3、专业课程模块 | 55.5 |
| 公共基础课程 | 32 | 专业必修课程 | 33.5 |
| 通识教育课程 | 必修 | 12 | 专业选修课程 | 22 |
| 选修 | 4 | 4、实践教学模块 | 20.5 |
| 2、学科基础平台 | 46 | 专业实践课程 | 必修 | 20.5 |
| 专业学科基础课程 | 必修 | 41 | 选修 | 0 |
| 选修 | 5 | 5、素质拓展模块 | 6 |

\*通识教育选修课4学分包括：人文社科类1学分、艺术体育类1学分、自然科学类1学分、经济管理类 1学分

**VI. Credits required for graduation：176 credits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of courses** | **Academic credits** | **Type of courses** | **Academic credits** |
| 1.Common Courses | 48 | 3. Specialized Courses | 55.5 |
| Common Basic Courses | 32 | Required Courses | 33.5 |
| General Education Courses | Required Courses | 12 | Elective Courses | 22 |
| Elective Courses | 4 | 4.Practicum and Internship Courses | 20.5 |
| 2.General Disciplinary Courses  | 46 | Disciplinary Practical Courses | Required Courses | 20.5 |
| Disciplinary Basic Courses | Required Courses | 41 | Elective Courses | 0 |
| Elective Courses | 5 | 5.Quality Development Courses | 6 |

1. **学分比例**

**VII. Ratio of Credits**

1. **必修选修学分比例**

**The proportion of compulsory elective credits**

|  |  |  |
| --- | --- | --- |
| 类别 | 学分 | 占总学分比例 |
| 必修 | 145 | 82.39% |
| 选修 | 31 | 17.61% |

1. **实践教学环节学分比例**

**The Proportion of credits in practice teaching**

|  |  |  |  |
| --- | --- | --- | --- |
| 实践教学环节 | 实验教学学分 | 23 | 30% |
| 实践教学模块 | 20.5 |
| 素质拓展模块 | 6 |

1. **毕业要求实现矩阵**

**VIII. Graduation Realization Matrix**

| **课程名称** | **课程****性质** | **安全工程专业毕业要求指标点** |
| --- | --- | --- |
| **1-1** | **1-2** | **1-3** | **1-4** | **2-1** | **2-2** | **2-3** | **2-4** | **3-1** | **3-2** | **3-3** | **3-4** | **4-1** | **4-2** | **4-3** | **5-1** | **5-2** | **5-3** | **6-1** | **6-2** | **7-1** | **7-2** | **8-1** | **8-2** | **8-3** | **9-1** | **9-2** | **10-1** | **10-2** | **10-3** | **11-1** | **11-2** | **11-3** | **12-1** | **12-2** |
| 通识平台 | 思想道德修养与法律基础 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 中国近现代史纲要 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 马克思主义基本原理 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 毛泽东思想与中国特色社会主义理论体系概论 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 大学计算机基础 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学英语 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |
| 体育 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  | H | H |  |  |  |  |  |  |  |  |
| 大学生心理健康教育 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  | H |  |
| 职业生涯规划与就业创业指导 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  | H |  |
| 军事课 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 公益劳动 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  | H |  |  |  |  |  |  |  |  |  |
| 形式与政策 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |
| 学科基础平台 | 机械制图 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 机械设计基础 | 必修 |  |  |  |  |  |  |  |  | H | M |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 线性代数 | 必修 | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 概率论与数理统计 | 必修 | H |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工程力学 | 必修 |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 高等数学 | 必修 | H |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学物理 | 必修 |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 大学物理实验 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 普通化学 | 必修 |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 普通化学实验 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 信息检索与利用 | 限选 |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |
|  | 岩土力学 | 必修 |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 建筑火灾安全工程 | 必修 |  |  |  | H |  | M |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |
| 安全管理 | 必修 |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  | H |  |  | H |  |  |  |  |
| 专业核心课程 | 安全系统工程 | 必修 |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |
| 电气安全工程 | 必修 |  |  | M |  |  |  |  | H |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 锅炉压力容器安全技术 | 必修 |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 建筑施工安全技术 | 必修 |  |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |
| 工业通风 | 必修 |  |  |  | H |  |  |  |  |  |  |  |  | M |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工程热力学与传热学 | 必修 |  |  | H |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 防火防爆安全技术 | 必修 |  |  | H |  |  | M |  |  |  |  |  |  |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 流体力学泵与风机 | 必修 |  |  | H |  | H |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 职业危害与控制 | 必修 |  |  |  |  |  |  |  |  | H |  |  | H |  |  |  |  | H |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 安全科学与技术研讨 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  | M |  |  |  | H |  |
| 矿山安全技术 | 限选 |  |  |  | H |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 安全评价 | 限选 |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  | H | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工程项目管理 | 限选 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  | H | H | H |  |  |
| 安全法规与案例分析 | 限选 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |
| 三维数字建模基础 | 限选 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |
| 安全检测技术 | 限选 |  |  | M |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 安全人机工程 | 限选 |  |  |  |  |  | H |  |  |  |  |  | H |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 实践教学模块 | 金工实习 | 必修 |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  | M |  |  |  |  |  |  |  |  |  |
| 认识实习 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  | M |  |  |  |  |  |  |
| 生产实习 | 必修 |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  | M |  |  | M |  |  |  |  |  |  |  |
| 毕业实习 | 必修 |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  | H |  | H |  |  |  |  |  |  |
| 毕业设计（论文） | 必修 |  |  |  |  |  |  |  |  |  |  |  | H |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  | H |
| 机械设计基础课程设计 | 必修 |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  | H | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 工业通风课程设计 | 必修 |  |  |  |  |  |  |  |  |  | H | H |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 防火防爆课程设计 | 必修 |  |  |  |  |  |  | H |  |  | H |  |  |  |  |  | M | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 素质拓展模块 | 创新创业教育 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  | H |  |
| 第二课程 | 必修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  | M |  | M |  |  |  |  |  |  |  |
| 通识教育平台课程 | 人文社科类课程 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 经济管理类课程 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |
| 艺术体育类课程 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 自然科学类课程 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |
| 学科基础平台课程 | 电工技术 | 选修 |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 电子技术 | 选修 |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 计算机程序设计基础 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M | M |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 数学建模 | 选修 |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 运筹学 | 选修 |  |  | M |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |
| 专业选修课程 | 房屋建筑学 | 选修 |  |  | H |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  | M |  |  |  |  |
| 机械安全技术 | 选修 |  |  |  | H |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 防排烟工程 | 选修 |  |  | H |  |  |  |  | H |  |  |  |  |  |  |  |  | H |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 矿井通风与安全 | 选修 |  |  | H |  |  | H |  | M |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 火灾风险评价 | 选修 |  |  |  |  |  |  |  | H |  |  |  |  |  |  |  |  |  |  | H | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 专业英语 | 选修 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  | H |
| 冶金概论 | 选修 |  |  | H |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 道路运输安全技术 | 选修 |  |  | H |  |  | H |  |  |  |  |  | M |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 灾害应急与救援 | 选修 |  |  |  | H |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | H |  |  |  |  | M |  |  | M |  |  |  |  |  |  |  |

**九、课程修读进程表**



**十、教学环节设置及学分分布表**

X.Offered Course and Distribution of Academic Credits

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **课程类型** | **课程性质** | **课程编码** | **课程名称** | **学分** | **合计** | **课内学时** | **实践学时** | **学期** | **是否双学位** | **先修课程/备注** |
| **讲课** | **实验** | **上机** |
|  平台平台 | 公共课程平台课程 | 公共基础课程 | 必修 | 5105001 | 思想道德修养与法律基础Moral Cultivation and Basics of Law | 3 | 48 | 42 |  |  | 6 | 1 |  |  |
| 5103001 | 中国近现代史纲要An Outline of Modern and Contemporary History of China | 3 | 48 | 42 |  |  | 6 | 2 |  |  |
| 5102001 | 马克思主义基本原理Fundamentals of Marxism | 3 | 48 | 44 |  |  | 4 | 3 |  |  |
| 5101001 | 毛泽东思想与中国特色社会主义理论体系概论Theoretical system of socialism with Chinese characteristics | 5 | 80 | 64 |  |  | 16 | 4 |  |  |
| 1401840 | 大学英语（一）College English (I) | 3 | 48 | 48 |  |  |  | 1 |  |  |
| 1401841 | 大学英语（二）College English(II) | 3 | 48 | 48 |  |  |  | 2 |  |  |
| 1401842 | 大学英语（三）College English (III) | 3 | 48 | 48 |  |  |  | 3 |  |  |
| 1401843 | 大学英语（四）CollegeEnglish(IV) | 3 | 48 | 48 |  |  |  | 4 |  |  |
| 1501882 | 体育(一)Physical Education (I) | 1 | 26 | 26 |  |  |  | 1 |  |  |
| 1501883 | 体育(二)Physical Education (II) | 1 | 34 | 34 |  |  |  | 2 |  |  |
| 1501884 | 体育(三)Physical Education (III) | 1 | 34 | 34 |  |  |  | 3 |  |  |
| 1501885 | 体育(四)Physical Education (IV) | 1 | 34 | 34 |  |  |  | 4 |  |  |
| 5106001 | 形势与政策World Affairs and State Policy | 2 | 64 | 64 |  |  |  | 1-8 |  | 分散进行 |
| 通识教育课程 | 必修 | 1306001 | 大学计算机基础AIntroduction to Computer Science | 3 | 48 | 30 |  | 18 |  | 1 |  |  |
| 2501002 | 公益劳动Community Service | 1 | 16 |  |  |  | 16 | 4 |  | 分散进行 |
| 2502001 | 大学生心理健康教育Mental Health Education | 2 | 32 | 24 |  |  | 8 | 1 |  |  |
| 2503001 | 职业生涯规划与就业指导Career Plan and Vocational Guidance | 1 | 16 | 16 |  |  |  | 2 |  |  |
| 2504003 | 军事课Military Course | 4 | 148 | 36 |  |  | 112 | 1,2 |  |  |
| 8001001 | 创业学基础Fundamentals of entrepreneurship | 1 | 16 | 16 |  |  |  | 2 |  |  |
| 选修 |  | 人文社科类1学分Humanity and Social Science 1 Academic Credit |
|  | 经济管理类1学分Economic and Management 1 Academic Credit |
|  | 自然科学类1学分Natural Science 1 Academic Credit |
|  | 艺术体育类1学分Artistic and Sports 1 Academic Credit |
| 学科基础平台课程 | 专业学科基础课程 | 必修 | 0302607 | 机械制图B(一)Mechanical Drawing B (I) | 2.5 | 40 | 34 |  | 6 |  | 1 |  |  |
| 0302608 | 机械制图B(二)Mechanical Drawing B (II) | 2 | 32 | 28 |  | 4 |  | 2 |  |  |
| 0304602 | 机械设计基础BBasics of Mechanical Design B | 3.5 | 56 | 50 | 6 |  |  | 5 |  |  |
| 0702026 | 线性代数Linear Algebra | 2 | 32 | 32 |  |  |  | 3 |  |  |
| 0702303 | 概率论与数理统计AProbability Theory and Mathematical Statistics A | 3 | 48 | 48 |  |  |  | 4 |  | 高等数学 |
| 0701605 | 工程力学AEngineering Mechanics A | 4.5 | 72 | 66 | 6 |  |  | 2 |  |  |
| 0702601 | 高等数学A(一)Advanced Mathematics A (I) | 5 | 80 | 80 |  |  |  | 1 |  |  |
| 0702602 | 高等数学A(二)Advanced Mathematics A (II) | 6.5 | 104 | 104 |  |  |  | 2 |  |  |
| 0703601 | 大学物理A(一)College Physics A(I) | 3 | 48 | 48 |  |  |  | 2 |  |  |
| 0703602 | 大学物理A (二)College Physics A(II) | 3  | 48 | 48 |  |  |  | 3 |  |  |
| 0703603 | 大学物理实验A (一)Experiments in College PhysicsA (I) | 2 | 32 |  | 32 |  |  | 2 |  |  |
| 0703604 | 大学物理实验A (二)Experiments in College PhysicsA (II) | 1 | 16 |  | 16 |  |  | 3 |  |  |
| 2206006 | 普通化学General Chemistry | 2 | 32 | 32 |  |  |  | 1 |  |  |
| 2253017 | 普通化学实验Experiments in General Chemistry | 1 | 16 |  | 16 |  |  | 1 |  |  |
| 选修 | 0401001 | 电工技术Electrotechnical | 2 | 32 | 22 | 10 |  |  | 3 |  |  |
| 0401004 | 电子技术Electronic Technology | 3 | 48 | 36 | 12 |  |  | 4 |  |  |
| 1306008  | C语言程序设计基础 Basics of C Programming Language | 4  | 64  | 40  | 0  | 24  | 0  | 2  |  | 大学计算机基础A |
| 1601004 | 信息检索与利用Information Retrieval | 1 | 16 | 6 |  | 10 |  | 4 |  | 限选 |
| 0702019 | 数学建模Mathematical Modeling | 2 | 32 | 28 |  | 4 |  | 4 |  |  |
| 0101027 | 运筹学Operational Research | 2.5 | 40 | 40 |  |  |  | 6 |  |  |
| 模块模块模块 | 专业课程模块专业课程模块 | 专业必修课程 | 必修 | 0101025 | 岩土力学Geotechnical | 3 | 48 | 48 |  |  |  | 6 |  |  |
| 0105035 | 建筑火灾安全工程Building Fire Safety Engineering | 3 | 48 | 44 | 4 |  |  | 5 |  |  |
| 0105001 | 安全管理Safety Management | 2.5 | 40 | 36 |  | 4 |  | 5 |  |  |
| 0105002 | 安全系统工程Safety System Engineering | 2 | 32 | 32 |  |  |  | 5 |  |  |
| 0105006 | 电气安全工程Electrical Safety Engineering | 2 | 32 | 32 |  |  |  | 5 |  |  |
| 0105011 | 锅炉压力容器安全技术Boiler and Pressure Vessel Safety Technology | 2.5 | 40 | 36 | 4 |  |  | 6 |  |  |
| 0105026 | 建筑施工安全技术Building Construction Safety Technology | 2 | 32 | 32 |  |  |  | 7 |  |  |
| 0105038 | 工业通风Industrial Ventilation | 2.5 | 40 | 34 | 6 |  |  | 6 |  |  |
| 0105064 | 工程热力学与传热学Engineering Thermodynamics and Heat Transfer | 3.5 | 56 | 56 |  |  |  | 5 |  |  |
| 0105108 | 防火防爆安全技术Fire Prevention and Explosion Protection Technologies | 3 | 48 | 44 | 4 |  |  | 6 |  |  |
| 0105146 | 流体力学泵与风机Fluid Mechanics, Pump and Fan | 3.5 | 56 | 52 | 4 |  |  | 4 |  |  |
| 0105131 | 职业危害与控制Occupational Hazards and Control | 2 | 32 | 28 | 4 |  |  | 6 |  |  |
| 0105130 | 安全科学与技术研讨Seminar of Safety Science and Technology | 2 | 32 | 32 |  |  |  | 7 |  |  |
| 专业选修课程 | 选修 | 0105040 | 安全评价Safety Evaluation | 2.5 | 40 | 38 |  | 2 |  | 6 |  | 限选 |
| 0101181 | 工程项目管理Project Management | 2.5 | 40 | 40 |  |  |  | 5 |  | 限选 |
| 0101198 | 矿山安全技术Mine Safety Technology | 2 | 32 | 32 |  |  |  | 7 |  | 限选 |
| 0105003 | 安全法规与案例分析Safety Laws/Regulations and Case Analysis  | 2 | 32 | 32 |  |  |  | 7 |  | 限选 |
| 0105126 | 防排烟工程Smoke Control Engineering | 2.5 | 40 | 36 | 4 |  |  | 6 |  |  |
| 0101173 | 三维数字建模基础Basis of 3D Digital Modeling | 2.5 | 40 | 24 |  | 16 |  | 6 |  | 限选 |
| 0101083 | 房屋建筑学Architectural Construction | 3 | 48 | 48 |  |  |  | 5 |  |  |
| 0105008 | 噪声污染控制BNoise Control Technology | 2 | 32 | 28 | 4 |  |  | 7 |  |  |
| 0101195 | 矿井通风与安全Ventilation and Safety in Mines | 2.5 | 40 | 40 |  |  |  | 6 |  |  |
| 0105120 | 安全人机工程Safety Human Engineering | 2 | 32 | 28 | 4 |  |  | 6 |  | 限选 |
| 0105121 | 安全检测技术Safety Detection Technology | 3 | 48 | 40 | 8 |  |  | 6 |  | 限选 |
| 0105127 | 火灾风险评价Fire Risk Evaluation | 2 | 32 | 28 |  | 4 |  | 6 |  |  |
| 0105614 | 专业英语Specialized English | 2 | 32 | 32 |  |  |  | 5 |  |  |
| 0204015 | 冶金概论Conspectus of Mining Production | 1.5 | 24 | 24 |  |  |  | 5 |  |  |
| 2301184 | 交通运输安全技术Traffic Safety Technology | 2 | 32 | 32 |  |  |  | 7 |  |  |
| 0925086 | 灾害应急与救援Disaster Emergency and Rescue | 2 | 32 | 32 |  |  |  | 7 |  |  |
| 0105132 | 化工安全技术Chemical Safety Technology | 2 | 32 | 32 |  |  |  | 6 |  |  |
| 0105160 | 机械安全技术Mechanical Safety Technology | 2 | 32 | 28 | 4 |  |  | 7 |  |  |
| 实践教学模块 | 专业实践课程 | 必修 | 1701008 | 工程训练BEngineering Training B | 1.5 | 48 |  |  |  | 48 | 3 |  |  |
| 0105057 | 认识实习Introductory Practice | 2 | 2周 |  |  |  | 2周 | 5 |  |  |
| 0304010 | 机械设计基础课程设计Course Project in Basics of Mechanical Design | 1 | 2周 |  |  |  | 2周 | 5 |  |  |
| 0105058 | 生产实习Production Practice | 3 | 3周 |  |  |  | 3周 | 7 |  |  |
| 0105005 | 毕业实习APre-graduation Practice Experience | 3 | 3周 |  |  |  | 3周 | 8 |  |  |
| 0105098 | 毕业设计(论文)Pre-graduation Internship | 8 | 14周 |  |  |  | 14周 | 8 |  |  |
| 0105090 | 工业通风课程设计Project Design in Industrial Ventilation | 1 | 2周 |  |  |  | 2周 | 6 |  | 工业通风 |
| 0105109 | 防火防爆课程设计Course Project in Fire Prevention and Explosion Protection | 1 | 2周 |  |  |  | 2周 | 7 |  | 防火防爆安全技术 |
| 素质拓展模块 | 创新创业教育 | 必修 |  | 创新创业实践3学分Innovation Practices 3 Academic Credits |
| 第二课程 |  | 第二课堂3学分Second Classroom 3 Academic Credits |

**十一、教学进程安排表**

|  |  |
| --- | --- |
| 学期 | 周 次 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1 | ♀ | ♀ | ⊙/★ | ★ | ★ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ● |  |  |  | 　 | 　 | 　 | 　 | 　 | 　 |
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| 4 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | ● |  |  |  | 　 | 　 | 　 | 　 | 　 | 　 |
| 5 | ╬ | ╬ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | ● |  |  |  | 　 | 　 | 　 | 　 | 　 | 　 |
| 6 | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | ● |  |  |  | 　 | 　 | 　 | 　 | 　 | 　 |
| 7 | ∕ | ∕ | ∕ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | □ | × | × | ● |  |  |  |  |  |  |  |  |  |
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符号说明：

1、♀ 入学前机动 2、⊙ 入学教育 3、★ 军训 4、□理论教学 5、√ 机动时间 6、●考试 7、×课程设计 8、Ε专业实验或实习 9、—假期

10、▲ 学年论文 11、Ｇ技能训练 12、※ 毕业设计（论文） 13、┼毕业鉴定 14、＃毕业实习 15、Ｓ写生 16、∕ 生产实习(金工实习)

17、Τ教材教法 18、☆ 教育实习 19、○技能教育实习 20、◎ 专题讲座 21、◆ 公益劳动 22、△ 社会调查 23、╬ 认识实习