

水资源与环境学院

School of Water Resources and Environment



水文与水资源工程专业培养方案

一、专业培养目标

本专业面向国家水资源开发利用与生态文明建设需求，培养德、智、体、美、劳全面发展，具备较好的人文素质、扎实的自然科学基础和较强的计算机、外语水平，掌握水文水资源、岩土工程及其赋存地质环境方面的专业知识，具备分析与解决问题能力的专业人才。毕业后可在水利、自然资源、城建、环保等部门从事勘查、规划、设计、预报、监测、评价及科研、管理等工作。经过5年的实际工作，能够成为专业骨干，具备工程师或与之相当的专业技术能力，并能通过不断学习适应发展。

二、毕业要求

1 工程知识：掌握数学、物理、化学、计算机以及地球科学等方面的基础知识、基本原理和基本野外工作方法，掌握解决复杂工程问题的专业基础知识；能够将数学、自然科学、工程基础和专业知识用于解决复杂水文水资源以及相关工程问题；

2 问题分析：能够应用数学、自然科学和工程科学的基本知识和原理，识别、表达水文水资源以及相关领域的复杂工程问题，能通过文献研究分析复杂工程问题，以获得有效结论；

3 设计/开发解决方案：能够针对水文水资源及相关领域复杂工程问题设计满足特定需求的解决方案，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，并采用科学方法对水文与水资源及相关领域复杂工程问题进行研究，能够设计实验、分析与解释相关研究数据、并通过对信息的综合分析得到合理有效的结论；

5 使用现代工具：能够针对水文水资源及相关领域复杂工程问题，开发、选择与使用恰当的技术、资源、现代工程工具、信息技术工具和专业软件，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：能够基于工程相关背景知识对水文水资源及相关领域具体工程问题进行合理分析，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；

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，热爱祖国，了解中国国情，自觉树立和践行社会主义核心价值观；了解与水文水资源以及相关行业和职业有关的法律、法规、国家和行业标准，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；

9 个人和团队：能够理解团队的重要性以及各种角色的责任和义务，具有团队合作意识和协调能力，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 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。较熟练地掌握一门外语，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。

三、主干学科

水利工程。

四、学制与学位

学制四年，学生修满所规定的最低毕业学分，达到培养目标规定的各项要求后，授予工学学士学位。

五、核心课程

本专业核心课程包括水文学原理、水力学、水利水电工程概论、水文统计与水文预报、水资源评价与开发利用、水文地质学基础、地下水水力学、气象与气候学、工程岩土学及实验、土力学与地基基础、工程岩体力学、水生态与水环境保护、水文地球化学基础、生态与环境水文地质学、学科前沿课程、水文与水资源工程专业英语。

主要实践环节包括北戴河地质认识实习、周口店地质教学实习、水文与水资源工程专业实习、综合课程设计等。

Undergraduate Programme in Hydrology and Water Resources Engineering

1. Academic Objectives

Focusing on the needs of water resources development and ecological civilization construction of China, the major of Hydrology and Water Resources Engineering aims to cultivate professionals that has comprehensive development of moral, intellectual, physical, aesthetic and labor; has good humanistic quality, solid foundation of natural sciences, strong computer skills and foreign language levels; to acquire the professional knowledge in hydrology and water resources, geotechnical engineering and its geological environment; has the ability to analyze and solve problems. Graduates will be qualified for working in exploration, planning, design, forecast, monitoring, evaluation, scientific research and management in hydraulic engineering, natural resources, urban construction, environmental protection and other departments. A graduate can become a professional backbone and hold a middle class professional title of engineer after five years of practical work, and can adapt to development through continuous learning.

2. Graduation Requirements

1. To acquire the basic theories and knowledge of mathematics, physics, chemistry and geosciences; and have the ability using these professional and basic knowledges in solving complex engineering problems; To use mathematics, natural science, engineering foundation and professional knowledges to solve complex hydrological and water resources issues and related engineering problems;

2. To apply the basic knowledge and principles of mathematics, natural science and engineering science to identify and express complex engineering problems in hydrology and water resources and related fields, and have the ability to get effective conclusions through literature research and analysis of complex engineering problems;

3. To be able to design solutions for complex engineering problems in hydrology and water resources and related fields with specific needs, and show creative thinking in the process of design, considering social, health, safety, legal, cultural and environmental factors;

4. To be able to study complex engineering problems in hydrology, water resources and related fields using the scientific principles and methods, and can design experiments, analyze and interpret relevant research data, and get reasonable and effective conclusions through comprehensive analysis of the information;

5. To be able to develop, select and apply appropriate technologies, resources, modern engineering tools, information technology tools and professional software for solving complex engineering problems in hydrology and water resources and related fields, including the prediction and simulation of complex engineering problems considering their limitations;

6. To be able to analyze specific engineering problems in hydrology and water resources and related fields reasonably, based on basic engineering knowledges, and to evaluate the impact of engineering practice and complex engineering problem solutions on the society, health, safety, law and culture;

7. To be able to understand and evaluate the impact of engineering practice on environmental and social sustainable development;

8. To get the quality of humanities and social sciences and love the motherland with the understanding of the China's national conditions, and to establish and practice the core socialist values; To be able to understand the laws, regulations, national and industrial standards related to hydrology and water resources and related industries and professions, to understand and abide by engineering professional ethics and norms

in engineering practice, and take the responsibilities;

9. To be able to understand the importance of the teamwork, and the responsibilities and obligations of various roles, and to have the ability of cooperation and coordination in the team. To be able to play the roles of individual, team member and leader in a multidisciplinary team;

10. To be able to effectively communicate with peers in the industry and the public on complex engineering problems, including writing reports and design manuscripts, making statements, clearly expressing or responding to instructions. To grasp a foreign language, with a certain international vision, and able to communicate in a cross-cultural context;

11. To understand and grasp the engineering management principles and economic decision-making methods, and be able to apply them in a multidisciplinary environment;

12. To have the consciousness of self-learning and lifelong learning, and to be able to continuous learn and adapt to development.

3. Main disciplines

Hydraulic Engineering.

4. Length of Schooling and Degree

Duration of the Program: Four years

Degree Offered: Bachelor of Engineering

5. Core Courses

The core courses include Introduction to Hydrology, Hydraulics, Introduction to Hydraulic Engineering, Hydrological statistics and hydrological forecast, Water Resources Assessment and Development, Fundamentals of Hydrogeology, Groundwater Hydraulics, Meteorology and climatology, Engineering geotechnical and experiment, Soil Mechanics and Foundation Engineering, Engineering Rockmass Mechanics, Hydroecology and Water Environment, Introduction to Hydrogeochemistry, Ecological and Environmental Hydrogeology, Frontiers of Hydrology and Water Resources Engineering, and English for Hydrology and Water Resources Engineering.

The main practice teaching includes Geological Survey Field Trip in Beidaihe, Geological Survey Field Trip in Zhoukoudian, Practice of Hydrology and Water Resources Engineering, and Integrated Course Design, etc.

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

| 课程模块 Course module | 课程类别 Course Classification | 学时数 Hours | 学分 Credits | 学期 Semester | | | | | | | | | | |
|-----------------------------------|----------------------------------------------------|--------------|---------------|-------------|------|----|------|------|----|------|------|----|------|------|
| | | | | 1 | 2 | 1夏 | 3 | 4 | 2夏 | 5 | 6 | 3夏 | 7 | 8 |
| 通识教育 Liberal Education | 通识教育必修课程 Required Courses of General Education | 730 | 40 | 11.25 | 9.25 | | 8.25 | 5.25 | 1 | 3.25 | 1.25 | | 0.25 | 0.25 |
| | 通识教育选修课程 Selective Courses of General Education | 192 | 12 | 1 | | | | | | | | | | |
| 专业教育 Professional Education | 学科基础课程 Disciplinary Fundamental Courses | 928 | 58 | 10 | 13 | | 11.5 | 15.5 | | 8 | | | | |
| | 专业核心课程 Specialized Fundamental Courses | 384 | 24 | | | | | 3.5 | | 7 | 11.5 | | 2 | |
| | 专业拓展课程 Specialized Development | 128 | 8 | | | | | | | 2 | 3.5 | | 2.5 | |
| 实践教育 Practical Education | 课程实践 Course Practice | 29周+232学时 | 34.5 | | 3 | 3 | 1 | 1 | 7 | 1 | 5.5 | 7 | | 6 |
| | 课外实践 Extracurricular practice | 96 | 6 | | | | | | | | | | | |
| 必修课总学分 Required course credits | | | | 156.5 | | | | | | | | | | |
| 选修课总学分 Elective course credits | | | | 26 | | | | | | | | | | |
| 最低毕业总学分 Total Credits | | | | 182.5 | | | | | | | | | | |

七、课程设置 (Curriculum)

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

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR181009 | 思想道德与法治 Ideological Morality and Rule of Law | 48 | 3 | 40 | 8 | | 考试 Exam | 1 | |
| GR181008 | 中国近现代史纲要 Essentials of Modern Chinese History | 48 | 3 | 40 | 8 | | 考试 Exam | 2 | |
| GR182014 | 马克思主义基本原理 Fundamental Principles of Marxism | 48 | 3 | 40 | 8 | | 考试 Exam | 3 | |
| GR182024 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| GR182022 | 习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era | 48 | 3 | 48 | | | 考试 Exam | 5 | |
| GR181013 | 形势与政策 (1) Situation and Policy (1) | 4 | 0.25 | 4 | | | 考查 Term Paper | 1 | |
| GR181014 | 形势与政策 (2) Situation and Policy (2) | 4 | 0.25 | 4 | | | 考查 Term Paper | 2 | |
| GR181015 | 形势与政策 (3) Situation and Policy (3) | 4 | 0.25 | 4 | | | 考查 Term Paper | 3 | |
| GR181016 | 形势与政策 (4) Situation and Policy (4) | 4 | 0.25 | 4 | | | 考查 Term Paper | 4 | |
| GR181017 | 形势与政策 (5) Situation and Policy (5) | 4 | 0.25 | 4 | | | 考查 Term Paper | 5 | |
| GR181018 | 形势与政策 (6) Situation and Policy (6) | 4 | 0.25 | 4 | | | 考查 Term Paper | 6 | |
| GR181019 | 形势与政策 (7) Situation and Policy (7) | 4 | 0.25 | 4 | | | 考查 Term Paper | 7 | |
| GR181020 | 形势与政策 (8) Situation and Policy (8) | 4 | 0.25 | 4 | | | 考查 Term Paper | 8 | |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR301004 | 大学生职业生涯规划与就业指导(1) Career Planning and Employment Guidance for University Students (1) | 20 | 1 | 16 | 4 | | 考试 Exam | 2 | |
| GR303005 | 大学生职业生涯规划与就业指导(2) Career Planning and Employment Guidance for University Students (2) | 18 | 1 | 12 | 6 | | 考试 Exam | 6 | |
| GR301005 | 大学生心理素质教育(1) Mental Health (1) | 16 | 1 | 16 | | | 考查 Term Paper | 1 | |
| GR303006 | 大学生心理素质教育(2) Mental Health (2) | 16 | 1 | 16 | | | 考查 Term Paper | 5 | |
| GR302008 | 军事理论 Military Theory | 36 | 1 | 36 | | | 考试 Exam | 3 | |
| GR081071 | 大学英语(1) College English (1) | 64 | 4 | 64 | | | 考试 Exam | 1 | |
| GR081072 | 大学英语(2) College English (2) | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR081067 | 大学英语素质拓展课 Competence-oriented Education for College English | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR141005 | 体育(1)(系列课程) Physical Education (1) | 32 | 1 | | 32 | | 考试 Exam | 1 | |
| GR141006 | 体育(2)(系列课程) Physical Education (2) | 32 | 1 | | 32 | | 考试 Exam | 2 | |
| GR141007 | 体育(3)(系列课程) Physical Education (3) | 32 | 1 | | 32 | | 考试 Exam | 3 | |
| GR141008 | 体育(4)(系列课程) Physical Education (4) | 32 | 1 | | 32 | | 考试 Exam | 4 | |
| GR041001 | 大学计算机 College Computer | 32 | 2 | 16 | 16 | | 考试 Exam | 1 | |
| GR041003 | 程序设计基础A Fundamentals of Programming A | 64 | 4 | 24 | 24 | 16 | 考试 Exam | 3 | |
| 总计 Total | | 730 | 40 | 492 | 222 | 16 | | | |

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

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

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

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|--------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR050017 | 水文与水资源工程专业导论 Introduction to Hydrology and Water Resource Engineering | 16 | 1 | 16 | | | 考查 Term paper | 1 | 必选 |
| DR191001 | 高等数学 A (1) Advanced Mathematics A (1) | 96 | 6 | 96 | | | 考试 Exam | 1 | |
| DR191010 | 大学化学 College Chemistry | 48 | 3 | 48 | | | 考试 Exam | 1 | |
| DR191008 | 大学物理 (1) College Physics (1) | 48 | 3 | 48 | | | 考试 Exam | 2 | |
| DR011036 | 地球科学概论 Geosciences | 64 | 4 | 32 | 32 | | 考试 Exam | 2 | |
| DR191002 | 高等数学 A (2) Advanced Mathematics A (2) | 96 | 6 | 96 | | | 考试 Exam | 2 | |
| DR192005 | 线性代数 Linear Algebra | 32 | 2 | 32 | | | 考试 Exam | 3 | |
| DR192009 | 大学物理 (2) College Physics (2) | 48 | 3 | 48 | | | 考试 Exam | 3 | |
| DR052008 | 水力学 Hydraulics | 40 | 2.5 | 36 | 4 | | 考试 Exam | 3 | |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|---------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR012039 | 综合地质学 Synthetic Geology | 64 | 4 | 32 | 32 | | 考试 Exam | 3 | |
| DR192006 | 概率论与数理统计 Probability and Mathematics Statistic | 48 | 3 | 48 | | | 考试 Exam | 4 | |
| DR122001 | 测量学 A Surveying A | 40 | 2.5 | 24 | 16 | | 考试 Exam | 4 | |
| DR053007 | 水文地质学基础 Fundamentals of Hydrogeology | 56 | 3.5 | 48 | 8 | | 考试 Exam | 4 | |
| DR052075 | 地下水运动方程 Groundwater movement equation | 56 | 3.5 | 56 | | | 考试 Exam | 4 | |
| SR013025 | 第四纪地质与地貌学 Quaternary Geology and Geomorphology | 48 | 3 | 24 | 24 | | 考试 Exam | 4 | |
| DR053011 | 水利水电工程概论 Introduction to Hydraulic Engineering | 40 | 2.5 | 40 | | | 考试 Exam | 5 | |
| SR053076 | 水文地球化学基础 Introduction to Hydrogeochemistry | 48 | 3 | 40 | 8 | | 考试 Exam | 5 | |
| DR052010 | 水文学原理 Introduction to Hydrology | 40 | 2.5 | 36 | 4 | | 考试 Exam | 5 | |
| 总计 Total | | 928 | 58 | 800 | 128 | | | | |

4、专业核心课程 (Specialized Core Courses): 384 学时 (384 Hours), 24 学分 (24 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-----------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| SR052077 | 工程岩石学及实验 Engineering Petrology | 56 | 3.5 | 34 | 22 | | 考试 Exam | 4 | |
| SR053078 | 土力学与地基基础 Soil Mechanics and Foundation Engineering | 48 | 3 | 48 | | | 考试 Exam | 5 | |
| SR052041 | 气象与气候学 Meteorology and climatology | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053079 | 水生态与水环境保护 Hydroecology and Water Environment | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053082 | 工程岩体力学 Engineering Rockmass Mechanics | 32 | 2 | 32 | | | 考试 Exam | 6 | |
| SR053080 | 水文统计与水文预报 Hydrological statistics and hydrological forecast | 56 | 3.5 | 40 | 16 | | 考试 Exam | 6 | |
| SR053081 | 水资源评价与开发利用 Water Resources Assessment and Development | 48 | 3 | 48 | | | 考试 Exam | 6 | |
| SR053040 | 地下水水力学 Groundwater Hydraulics | 48 | 3 | 44 | | 4 | 考试 Exam | 6 | |
| SR054030 | 水文与水资源工程专业英语 English for Hydrology and Water Resources Engineering | 32 | 2 | 32 | | | 考试 Exam | 7 | |
| 总计 Total | | 384 | 24 | 342 | 38 | 4 | | | |

5、专业拓展课程 (Specialized Development Courses): 128 学时 (128 Hours), 8 学分 (8 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------|--------------|---------------|----------------|--------------------|----------------|--------------------|------------------|-------------|
| SS053083 | 生态与环境水文地质学 Ecology and Environmental Hydrogeology | 32 | 2 | 28 | 4 | | 考试 Exam | 5 | |
| SS050040 | 水文地质学进展 Advances in Hydrogeology | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050041 | 现代水文水资源的研究前沿 Research frontiers of modern hydrology and water resources | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050076 | 土壤 / 地下水污染修复前沿 Advances in soil/groundwater remediation | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS014130 | 地球关键带研究前沿 Research Frontiers of Earth Critical Zone | 16 | 1 | | | | 考查 Term Paper | 6 | 六选一 |
| SS050042 | 环境科学与工程学科前沿 Frontiers of Environmental Science and Engineering | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050079 | 地下水模拟不确定性分析 Uncertainty Analysis for Groundwater Flow Modeling | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SR053037 | 地质灾害与防治 Geological Hazard and Prevention | 40 | 2.5 | 36 | 4 | | 考试 Exam | 6 | |
| SS054084 | 工程经济与项目管理 Engineering Economy and Project Management | 40 | 2.5 | 40 | | | 考试 Exam | 7 | |
| 总计 Total | | 128 | 8 | 120 | 8 | | | | |

6、课程实践 (Course Practice): 29 周 +232 学时 (29 weeks and 232 hours), 34.5 学分 (34.5 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 周数 (学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------|-----------------------|---------------|--------------------|------------------|-------------|
| PR311003 | 军事技能训练 Military Theory and Practice | 2 周 | 1 | 考查 Term Paper | 1 | |
| PR181010 | 思想政治社会实践 Political Social Practice | 32 学时 | 2 | 考试 Exam | 1 夏 | |
| PR011044 | 北戴河地质认识实习 Geological Survey Field Trip in Beidaihe | 2 周 | 2 | 考查 Term Paper | 1 夏 | |
| PR191045 | 实验物理 (1) Physics Experiments (1) | 24 学时 | 1 | 考试 Exam | 2 | |
| PR191047 | 实验化学 Chemistry Experiments | 48 学时 | 2 | 考试 Exam | 2 | |
| PR012046 | 周口店地质教学实习 Geological Survey Field Trip in Zhoukoudian | 5 周 | 5 | 考查 Term Paper | 2 夏 | |
| PR192046 | 实验物理 (2) Physics Experiments (2) | 24 学时 | 1 | 考试 Exam | 3 | |
| PR122059 | 测量实习 Instructive Practice for Engineering Surveying | 1 周 | 1 | 考查 Term Paper | 4 | |
| PR052069 | 综合课程设计 (1) Integrated Course Design (1) | 16 学时 | 1 | 考查 Term Paper | 5 | |
| PR053067 | AutoCAD 与水工环制图 AutoCAD and Mapping for Hydrogeology | 32 学时 | 2 | 考试 Exam | 6 | |
| PR053086 | GIS 基础及水工环应用 GIS and Application in Geosciences | 40 学时 | 2.5 | 考查 Term Paper | 6 | |

| 课程代码 Course Code | 课程名称 Course Name | 周数(学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-----------------------------------------------------------------------|----------------------|---------------|--------------------|------------------|-------------|
| PR053070 | 综合课程设计(2) Integrated Course Design (2) | 16 学时 | 1 | 考查 Term Paper | 6 | |
| PR052087 | 水文与水资源工程专业实习 Practice of Hydrology and Water Resources Engineering | 7 周 | 7 | 考查 Term Paper | 3 夏 | |
| PR054066 | 毕业论文(论文) Graduation Design (Thesis) | 12 周 | 6 | 考查 Term Paper | 8 | |
| 总计 Total | | 31 周 +200 学时 | 34.5 | | | |

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

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

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

八、毕业要求与培养目标矩阵（工程教育认证类专业）

| 毕业要求 | 培养目标 | | | | 专业能力：具备分析与解决问题能力，毕业后可在水利自然资源、城建环保等部门从事勘查规划、设计、预报、监测、评价及科研、管理等工作 |
|-------------|------------------------------|-------------------------------------|----------------------------------|--|-----------------------------------------------------------------|
| | 人文素养：德、智、体、美、劳全面发展，具备较好的人文素质 | 基础知识具备较好的人文素质、扎实的自然科学基础和较强的计算机、外语水平 | 专业知识：掌握水文水资源、岩土工程及其赋存地质环境方面的专业知识 | | |
| 1. 工程知识 | | √ | √ | | |
| 2. 问题分析 | | √ | √ | | √ |
| 3. 设计 / 开发 | | | √ | | √ |
| 4. 研究 | | | √ | | √ |
| 5. 使用现代工具 | | | √ | | √ |
| 6. 工程与社会 | | | √ | | √ |
| 7. 环境和可持续发展 | | | √ | | √ |
| 8. 职业规范 | √ | | √ | | √ |
| 9. 个人与团队 | √ | | | | √ |
| 10. 沟通 | √ | | | | √ |
| 11. 项目管理 | | | | | √ |
| 12. 终身学习 | | | | | √ |

九、课程与毕业要求关系矩阵（工程教育认证类专业）

| 课程名称 | 毕业要求 | 课 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开 发解决方案 | (4) 研究 | (5) 使用现代 工具 | (6) 工程与社 会 | (7) 环境和可 持续发展 | (8) 职业规范 | (9) 个人和团 队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|----------------------|------|---|-------------|-------------|----------------------|-----------|-------------------|------------------|---------------------|-------------|------------------|------------|--------------|--------------|
| 思想道德与法治 | | | | | | | | | | H | | L | | |
| 毛泽东思想和中国特色社会主义理论体系概论 | | | | | | | | | | H | | | | |
| 中国近现代史纲要 | | | | | | | | | | M | | | | |
| 马克思主义基本原理 | | | | | | | | | | M | | | L | M |
| 习近平新时代中国特色社会主义思想概论 | | | | | | | | | | M | | | L | M |
| 形势与政策 | | | | | | | | | | H | | | | |
| 大学生心理素质教育 | | | | | | | | | | M | | | M | |
| 大学英语 | | | | | | | | | | | | H | | L |
| 大学英语素质拓展课 | | | | | | | | | | | | H | | L |
| 体育 | | | | | | | | | | | L | | | H |
| 大学计算机 | | | | | M | | H | | | | | | | M |
| 程序设计基础 A | | | | | L | M | H | | | | | | | M |
| 大学生职业生涯规划与就业指导 | | | | | | | | | | | M | L | | H |
| 高等数学 | M | | | H | | L | | | | | | | | |
| 线性代数 | M | | | H | | L | | | | | | | | |
| 概率论与数理统计 | M | | | H | | L | | | | | | | | |
| 大学物理 | H | | | M | L | M | | | | | | | | |
| 大学化学 | H | | | M | | M | | | L | | | | | |
| 地球科学概论 | | | | | | | | M | M | | | | | |
| 测量学 A | | | | M | | M | H | | | | | | | |
| 水文地质学基础 | M | | | H | M | M | | M | M | | | | | |
| 水力学 | H | | | H | M | M | L | L | | | L | | | |
| 地下水运动方程 | H | | | H | M | H | L | L | L | | | | | |
| 综合地质学 | M | | | H | | M | | | L | | | | | |
| 第四纪地质与地貌 | M | | | H | | M | | | L | | | | | |
| 水利水电工程概论 | H | | | H | L | L | | M | L | M | | | | |

| 课程名称 | 毕业要求 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开发解决方案 | (4) 研究 | (5) 使用现代工具 | (6) 工程与社会 | (7) 环境和可持续发展 | (8) 职业规范 | (9) 个人和团队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|----------------|------|----------|----------|---------------|--------|------------|-----------|--------------|----------|-----------|---------|-----------|-----------|
| 水文地球化学基础 | M | H | H | M | M | M | L | M | L | | | | |
| 气象学与气候学 | | H | H | M | H | M | | M | | | | | |
| 新生研讨课 | L | L | L | L | H | L | M | M | | M | M | | |
| 专业导论课 | H | H | H | H | H | H | H | H | | M | M | | |
| 水文与水资源工程专业英语 | H | H | H | | | | | M | | | H | | |
| 水文学原理 | H | H | H | H | M | L | L | L | | L | | | |
| 工程岩土学及实验 | H | H | H | H | M | M | M | L | | M | | | |
| 土力学与地基础 | H | H | H | H | M | | M | L | | M | | | |
| 工程岩体力学 | H | H | H | H | M | M | L | L | | M | | | |
| 水文统计与水文预报 | H | H | H | H | M | M | M | L | | L | | | |
| 水资源评价与开发利用 | H | H | H | H | M | M | H | H | | M | | | |
| 水生态与水环境保护 | H | H | H | H | M | M | H | H | | M | | M | |
| 地下水水力学 | M | H | H | H | H | M | H | H | | M | | | |
| 学科前沿课程 | H | H | H | H | H | M | H | H | | M | M | | |
| 地质灾害与防治 | H | H | H | H | M | L | H | H | | L | L | | |
| 生态与环境水文地质学 | H | H | H | H | M | M | H | H | | M | L | | |
| 军事理论 | | | | | | | M | | | H | | | |
| 军事技能训练 | | | | | | | | | | H | | | |
| 思想政治社会实践 | | | | | | | | | | H | | | |
| 实验物理 | | H | H | | H | | | | | | | M | M |
| 实验化学 | | H | H | | H | | | L | | | | | |
| 北戴河地质认识实习 | H | H | H | H | M | M | H | M | | | | | |
| 水文与水资源工程专业实习 | H | H | H | H | H | M | H | H | | | | | |
| 毕业论文 / 设计 (水文) | H | H | H | H | H | M | H | H | | | | | |
| AutoCAD 与水文环制图 | | | | | | H | | | | | | | |
| 工程经济与项目管理 | H | H | H | | M | | H | H | | M | | H | |
| 综合课程设计 I | H | H | H | H | M | | | M | | M | | | |
| 综合课程设计 II | H | H | H | H | M | | | M | | M | | | |
| GIS 基础与水文环应用 | H | H | H | M | M | H | L | L | | | | | |
| 通识教育选修课程 | | | | | | | H | H | | H | H | H | H |

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

地下水科学与工程专业培养方案

一、专业培养目标

本专业围绕国家地下水资源开发与生态文明建设需求，培养德、智、体、美、劳全面发展，具备较好的人文素质、扎实的数理基础和较强的计算机、外语水平，掌握地球科学基本理论和野外工作方法，精通地下水科学与工程的专业知识和技能，具备分析与解决问题能力的专业人才。毕业后可在自然资源、水利、城建、环保等部门从事与专业相关的勘查、规划、设计、监测、评价以及科研、管理等工作。经过5年的实际工作，能够成为专业骨干，具备工程师或与之相当的专业技术能力，并能通过不断学习适应发展。

二、毕业要求

1、工程知识：掌握数学、物理、化学、水力学、水文学、计算机、地质、水文地质等方面的基础知识，并能用于分析与解决地下水问题。

2、问题分析：能够应用地下水科学与工程的基本原理建立水文地质概念模型，正确描述地下水工程问题；能够通过文献研究寻求解决地下水工程问题的多种可行方案，获得有效结论。

3、设计/开发解决方案：能够设计针对不同地下水工程问题的解决方案，并能够在设计环节体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素。

4、研究：能够基于地下水科学与工程的基本原理并采用科学方法对地下水问题进行研究，包括设计实验、开展实验、分析与解释数据，通过综合分析得到合理有效的结论。

5、使用现代工具：掌握运用专业设备和仪器进行野外地下水调查、监测、取样及室内测试；熟悉并掌握一定专业软件，进行水化学数据分析、水文地质图件编制、地下水数值模拟等，定量分析与研究地下水科学与工程问题。

6、工程与社会：了解与地下水相关的国家法律法规和行业规范，能分析和评价地下水方面的工程实践对社会、健康、安全、法律、文化的影响，以及这些制约因素对项目实施的影响。

7、环境和可持续发展：理解国家生态文明建设和可持续发展的理念和内涵，能够理解和评价地下水工程对环境、社会可持续发展的影响。

8、职业规范：具有正确的价值观，能够在工程实践中理解并遵守职业道德和规范，履行责任。

9、个人和团队：具备良好的个人素养，具有良好的团队合作意识和协作精神，能够在多学科背景下的团队中根据需要承担相应的责任。

10、沟通：能够就地下水科学与工程问题撰写专业报告，能与业界同行及社会公众进行有效沟通和交流；具备一定的国际视野，能就专业问题用英语进行沟通和交流。

11、项目管理：理解并掌握地下水领域的工程管理原理、经济决策方法，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，能够采用合适的方法，提高自主学习能力，适应地下水科学与工程及社会发展需要的能力。

三、主干学科

地质学、地质资源与地质工程。

四、学制与学位

学制四年，学生修满所规定的最低毕业学分，达到培养目标规定的各项要求后，授予工学学士学位。

五、核心课程

核心课程：矿物学与岩石学、古生物学与地史学、构造地质学、测量学A、第四纪地质学与地貌学、地下水科学概论、水力学、地下水运动方程、水文学原理、地下水动力学、地下水水化学、工程土质土力学、地下水数值模拟、地下水监测、地下水资源评价、污染水文地质学、工程岩体力学、地下水勘查、地下水科学专论、地下水科学与工程专业英语、生态与环境水文地质学、地质灾害与防治。

主要实践性教学环节：测量实习、水文地质调查方法设计、GIS基础与水工环应用、毕业设计（论文）、军事理论及训练、北戴河地质认识实习、周口店地质教学实习、专业实习、地下水污染调查评价实践。

Undergraduate Program in Groundwater Science and Engineering

1. Academic Objectives

Focusing on the needs of groundwater resources development and ecological civilization construction of China, the major of Groundwater Science and Engineering aims to cultivate professionals that has comprehensive development of moral, intellectual, physical, aesthetic and labor; has good humanistic quality, solid mathematical foundation, strong computer skills and foreign language levels; grasps the basic theory of Earth Sciences and field work methods; and is proficient in professional knowledge and skills of groundwater science and engineering; has the ability to analyze and solve problems. Graduates can be qualified in exploration, planning, design, monitoring, evaluation, scientific research, management and some other works in such areas as natural resources, water conservancy, urban construction, environmental protection. A graduate can become a professional backbone and hold a middle-class professional title of engineer after five years of practical work, and can adapt to development through continuous learning.

2. Graduation Requirements

(1) Engineering knowledge: To master basic knowledge in mathematics, physics, chemistry, hydraulics, hydrology, computer, geology, hydrogeology, etc., and can be used to analyze and solve groundwater problems.

(2) Problem analysis: To apply the basic principles of groundwater science and engineering to establish hydrogeological conceptual models and correctly describe groundwater engineering problems; find a variety of feasible schemes to solve the groundwater engineering problems through literature research, and obtain effective conclusions.

(3) Design and develop solutions: To be able to design and develop solutions to resolve complex groundwater engineering problems with the sense of innovation and considering the factors of society, health, safety, law, culture, and environment.

(4) Research: To be able to study groundwater problems based on the basic principles and scientific methods of groundwater science and engineering, including designing experiments, conducting experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through comprehensive analysis.

(5) Using modern tools: To master the use of professional equipment and instruments for field groundwater surveys, monitoring, sampling, and indoor testing; be familiar with certain professional software for hydrochemical data analysis, hydrogeological map compilation, groundwater numerical simulation, etc., quantitatively analyze and study groundwater science and Engineering problems.

(6) Engineering and society: To understand the national laws and regulations and industry standards related to groundwater, and be able to analyze and evaluate the impact of groundwater engineering practices on society, health, safety, law, and culture, as well as the impact of these constraints on project implementation.

(7) Environment and sustainable development: To understand the concept and connotation of national ecological civilization construction and sustainable development, and be able to understand and evaluate the impact of groundwater engineering on the environment and sustainable development of society.

(8) Occupational norms: To establish correct values, be able to understand and abide by professional ethics and norms in engineering practice, and perform responsibilities.

(9) Individuals and teams: To have good personal qualities, a good sense of teamwork and collaboration

spirit, be able to undertake corresponding responsibilities as needed in a team with a multi-disciplinary background.

(10) Communication: To be able to write professional reports on groundwater science and engineering issues, be able to communicate effectively with industry colleagues and the public; have a certain international perspective, be able to communicate on professional issues in English.

(11) Project management: To understand and master engineering management principles and economic decision-making methods in the field of groundwater, and be able to apply them in a multidisciplinary environment.

(12) Lifelong learning: To have the consciousness of self-learning and lifelong learning, be able to adopt appropriate methods to improve the ability of self-learning and adapt to the needs of groundwater science and engineering and social development.

3. Main disciplines

Geology, Geological Resources and Geological Engineering.

4. Length of Schooling and Degree

Duration of the Program: Four years

Degree Offered: Bachelor of Engineering

5. Core Courses

Core Courses Mineralogy and Petrology, Paleontology and Historical Geology, Structural Geology, Surveying A, Quaternary Geology and Geomorphology, Introduction to Groundwater Sciences, Hydraulics, Equations of Groundwater Hydraulics, Introduction to Hydrology, Groundwater Dynamics, Groundwater Chemistry, Engineering Soil Mechanics, Groundwater Numerical Simulation, Groundwater Monitoring, Assessment of Groundwater Resources, Contaminant Hydrogeology, Engineering Rock Mass Mechanics, Investigation and Exploration of Groundwater, Special Topics of Groundwater Sciences, English for Groundwater Science and Engineering, Ecology and Environmental Hydrogeology, Geological hazards and prevention.

Practice courses Surveying Practice, Design of Groundwater Survey, Introduction to GIS and its Application in Groundwater sciences, Undergraduate Graduation Design (Thesis), Military Theory and Training, Geological Field Practice in Beidaihe, Geological Field Practice in Zhoukoudian, Practice of Groundwater science and Engineering, Practice of Groundwater Contaminant Investigation and Evaluation.

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

| 课程模块 Course module | 课程类别 Course Classification | 学时数 Hours | 学分 Credits | 学期 Semester | | | | | | | | | | |
|-----------------------------------|----------------------------------------------------|---------------|---------------|-------------|------|----|------|------|----|------|------|-------|------|------|
| | | | | 1 | 2 | 1夏 | 3 | 4 | 2夏 | 5 | 6 | 3夏 | 7 | 8 |
| 通识教育 Liberal Education | 通识教育必修课程 Required Courses of General Education | 730 | 40 | 11.25 | 9.25 | | 8.25 | 5.25 | 1 | 3.25 | 1.25 | | 0.25 | 0.25 |
| | 通识教育选修课程 Selective Courses of General Education | 192 | 12 | 1 | | | | | | | | | | |
| 专业教育 Professional Education | 学科基础课程 Disciplinary Fundamental Courses | 896 | 56 | 10 | 13 | | 13 | 17.5 | | 2.5 | | | | |
| | 专业核心课程 Specialized Fundamental Courses | 448 | 28 | | | | | | | 12 | 11.5 | | 4.5 | |
| | 专业拓展课程 Specialized Development | 128 | 8 | | | | | | | 2 | 3.5 | | 2.5 | |
| 实践教育 Practical Education | 课程实践 Course Practice | 30周 +168学时 | 31.5 | | 3 | 4 | 1 | 1 | 7 | | 3.5 | 7 | | 6 |
| | 课外实践 Extracurricular practice | - | 6 | | | | | | | | | | | |
| 必修课总学分 Required course credits | | | | 155.5 | | | | | | | | | | |
| 选修课总学分 Elective course credits | | | | | | | | | | | | 26 | | |
| 最低毕业总学分 Total Credits | | | | | | | | | | | | 181.5 | | |

七、课程设置 (Curriculum)

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

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR181009 | 思想道德与法治 Ideological Morality and Rule of Law | 48 | 3 | 40 | 8 | | 考试 Exam | 1 | |
| GR181008 | 中国近现代史纲要 Essentials of Modern Chinese History | 48 | 3 | 40 | 8 | | 考试 Exam | 2 | |
| GR182014 | 马克思主义基本原理 Fundamental Principles of Marxism | 48 | 3 | 40 | 8 | | 考试 Exam | 3 | |
| GR182024 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| GR182022 | 习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era | 48 | 3 | 48 | | | 考试 Exam | 5 | |
| GR181013 | 形势与政策 (1) Situation and Policy (1) | 4 | 0.25 | 4 | | | 考查 Term Paper | 1 | |
| GR181014 | 形势与政策 (2) Situation and Policy (2) | 4 | 0.25 | 4 | | | 考查 Term Paper | 2 | |
| GR181015 | 形势与政策 (3) Situation and Policy (3) | 4 | 0.25 | 4 | | | 考查 Term Paper | 3 | |
| GR181016 | 形势与政策 (4) Situation and Policy (4) | 4 | 0.25 | 4 | | | 考查 Term Paper | 4 | |
| GR181017 | 形势与政策 (5) Situation and Policy (5) | 4 | 0.25 | 4 | | | 考查 Term Paper | 5 | |
| GR181018 | 形势与政策 (6) Situation and Policy (6) | 4 | 0.25 | 4 | | | 考查 Term Paper | 6 | |
| GR181019 | 形势与政策 (7) Situation and Policy (7) | 4 | 0.25 | 4 | | | 考查 Term Paper | 7 | |
| GR181020 | 形势与政策 (8) Situation and Policy (8) | 4 | 0.25 | 4 | | | 考查 Term Paper | 8 | |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR301004 | 大学生职业生涯规划与就业指导 (1) Career Planning and Employment Guidance for University Students (1) | 20 | 1 | 16 | 4 | | 考试 Exam | 2 | |
| GR303005 | 大学生职业生涯规划与就业指导 (2) Career Planning and Employment Guidance for University Students (2) | 18 | 1 | 12 | 6 | | 考试 Exam | 6 | |
| GR301005 | 大学生心理素质教育 (1) Mental Health (1) | 16 | 1 | 16 | | | 考查 Term Paper | 1 | |
| GR303006 | 大学生心理素质教育 (2) Mental Health (2) | 16 | 1 | 16 | | | 考查 Term Paper | 5 | |
| GR302008 | 军事理论 Military Theory | 36 | 1 | 36 | | | 考试 Exam | 3 | |
| GR081071 | 大学英语 (1) College English (1) | 64 | 4 | 64 | | | 考试 Exam | 1 | |
| GR081072 | 大学英语 (2) College English (2) | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR081067 | 大学英语素质拓展课 Competence-oriented Education for College English | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR141005 | 体育 (1) (系列课程) Physical Education (1) | 32 | 1 | | 32 | | 考试 Exam | 1 | |
| GR141006 | 体育 (2) (系列课程) Physical Education (2) | 32 | 1 | | 32 | | 考试 Exam | 2 | |
| GR141007 | 体育 (3) (系列课程) Physical Education (3) | 32 | 1 | | 32 | | 考试 Exam | 3 | |
| GR141008 | 体育 (4) (系列课程) Physical Education (4) | 32 | 1 | | 32 | | 考试 Exam | 4 | |
| GR041001 | 大学计算机 College Computer | 32 | 2 | 16 | 16 | | 考试 Exam | 1 | |
| GR041003 | 程序设计基础 A Fundamentals of Programming A | 64 | 4 | 24 | 24 | 16 | 考试 Exam | 3 | |
| 总计 Total | | 730 | 40 | 492 | 222 | 16 | | | |

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

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

3、学科基础课程 (Disciplinary Fundamental Courses): 896 学时 (896 Hours), 56 学分 (56 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|------------------------------------------------------------------------|--------------|---------------|----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR191001 | 高等数学 A (1) Advanced Mathematics A (1) | 96 | 6 | 96 | | | 考试 Exam | 1 | |
| DR191010 | 大学化学 College Chemistry | 48 | 3 | 48 | | | 考试 Exam | 1 | |
| DR050019 | 地下水科学与工程导论 Introduction to Science and Technology of Groundwater | 16 | 1 | 16 | | | 考查 Term Paper | 1 | |
| DR191002 | 高等数学 A (2) Advanced Mathematics A(2) | 96 | 6 | 96 | | | 考试 Exam | 2 | |
| DR191008 | 大学物理 (1) College Physics (1) | 48 | 3 | 48 | | | 考试 Exam | 2 | |
| DR011036 | 地球科学概论 Geosciences | 64 | 4 | 32 | 32 | | 考试 Exam | 2 | |
| DR192005 | 线性代数 Linear Algebra | 32 | 2 | 32 | | | 考试 Exam | 3 | |
| DR192009 | 大学物理 (2) College Physics (2) | 48 | 3 | 48 | | | 考试 Exam | 3 | |
| DR012066 | 矿物与岩石 Mineralogy and Petrology | 48 | 3 | 32 | 16 | | 考试 Exam | 3 | |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR012002 | 古生物学与地史学 Paleontology and Historical Geology | 32 | 2 | 32 | | | 考试 Exam | 3 | |
| DR012038 | 构造地质学 Structural Geology | 48 | 3 | 30 | 18 | | 考试 Exam | 3 | |
| DR192006 | 概率论与数理统计 Probability and Mathematics Statistic | 48 | 3 | 48 | | | 考试 Exam | 4 | |
| DR122001 | 测量学 A Surveying A | 40 | 2.5 | 24 | 16 | | 考试 Exam | 4 | |
| SR013025 | 第四纪地质学与地貌学 Quaternary Geology and Geomorphology | 48 | 3 | 24 | 24 | | 考试 Exam | 4 | |
| DR053012 | 地下水科学概论 Introduction to Groundwater Sciences | 56 | 3.5 | 48 | 8 | | 考试 Exam | 4 | |
| DR052013 | 水力学 Hydraulics | 32 | 2 | 28 | 4 | | 考试 Exam | 4 | |
| DR052075 | 地下水运动方程 Equations of Subsurface Hydraulics | 56 | 3.5 | 56 | | | 考试 Exam | 4 | |
| DR052010 | 水文学原理 Principles of Hydrology | 40 | 2.5 | 36 | 4 | | 考试 Exam | 5 | |
| 总计 Total | | 896 | 56 | 774 | 122 | | | | |

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

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|---------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| SR053046 | 地下水动力学 Groundwater Dynamics | 48 | 3 | 44 | 4 | | 考试 Exam | 5 | |
| SR053088 | 地下水水化学 Groundwater Chemistry | 56 | 3.5 | 40 | 16 | | 考试 Exam | 5 | |
| SR053049 | 工程土质土力学 Engineering and Soil Mechanics | 48 | 3 | 38 | 10 | | 考试 Exam | 5 | |
| SR053089 | 地下水数值模拟 Groundwater Numerical Modeling | 40 | 2.5 | 28 | | 12 | 考试 Exam | 5 | |
| SR054044 | 地下水监测 Groundwater Monitoring | 32 | 2 | 24 | 8 | | 考试 Exam | 6 | |
| SR053042 | 地下水资源评价 Assessment of Groundwater | 40 | 2.5 | 32 | | 8 | 考试 Exam | 6 | |
| SR053045 | 污染水文地质学 Contamination Hydrogeology | 48 | 3 | 48 | | | 考试 Exam | 6 | |
| SR053082 | 工程岩体力学 Mechanics of Engineering Rock Mass | 32 | 2 | 32 | | | 考试 Exam | 6 | |
| SR053043 | 地下水勘查 Investigation and Exploration of Groundwater | 32 | 2 | 32 | | | 考查 Term Paper | 6 | |
| SR054048 | 地下水科学专论 Special Topics on Groundwater Sciences | 40 | 2.5 | 38 | 2 | | 考试 Exam | 7 | |
| SR054050 | 地下水科学与工程专业英语 Specialty English for Groundwater Science and Engineering | 32 | 2 | 32 | | | 考试 Exam | 7 | |
| 总计 Total | | 448 | 28 | 388 | 40 | 20 | | | |

5、专业拓展课程 (Specialized Development Courses): 128 学时 (128 Hours), 8 学分 (8 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------|--------------|---------------|----------------|--------------------|----------------|--------------------|------------------|-------------|
| SS053083 | 生态与环境水文地质学 Ecological and Environmental Hydrogeology | 32 | 2 | 28 | 4 | | 考试 Exam | 5 | |
| SR053037 | 地质灾害与防治 Geological Hazard and Control | 40 | 2.5 | 36 | 4 | | 考试 Exam | 6 | |
| SS050040 | 水文地质学进展 Advances in Hydrogeology | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050041 | 现代水文水资源的研究前沿 Research frontiers of modern hydrology and water resources | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050076 | 土壤 / 地下水污染修复前沿 Advances in soil/groundwater remediation | 16 | 1 | | | | 考查 Term Paper | 6 | 六选一 |
| SS014130 | 地球关键带研究前沿 Research Frontiers of Earth Critical Zone | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050042 | 环境科学与工程学科前沿 Frontiers of Environmental Science and Engineering | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050079 | 地下水模拟不确定性分析 Uncertainty Analysis for Groundwater Flow Modeling | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS054084 | 工程经济与项目管理 Engineering Economy and Project Management | 40 | 2.5 | 40 | | | 考试 Exam | 7 | |
| 总计 Total | | 128 | 8 | 120 | 8 | | | | |

6、课程实践 (Course Practice): 30 周 +168 学时 (30 weeks and 168 hours), 31.5 学分 (31.5 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 周数 (学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------|-----------------------|---------------|--------------------|------------------|-------------|
| PR311003 | 军事技能训练 Military Theory and Practice | 2 周 | 1 | 考查 Term Paper | 1 | |
| PR181010 | 思想政治社会实践 Political Social Practice | 32 学时 | 2 | 考试 Exam | 1 夏 | |

| 课程代码 Course Code | 课程名称 Course Name | 周数(学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|------------------------------------------------------------------------------------|----------------------|---------------|--------------------|------------------|-------------|
| PR191045 | 实验物理(1) Physics Experiments (1) | 24 学时 | 1 | 考试 Exam | 2 | |
| PR191047 | 实验化学 Chemistry Experiments | 48 学时 | 2 | 考试 Exam | 2 | |
| PR192046 | 实验物理(2) Physics Experiments (2) | 24 学时 | 1 | 考试 Exam | 3 | |
| PR122059 | 测量实习 Surveying Practice | 1 周 | 1 | 考查 Term Paper | 4 | |
| PR053076 | 水文地质调查方法设计 Design for Groundwater Survey | 1 周 | 1 | 考查 Term Paper | 6 | |
| PR053086 | GIS 基础与水工环应用 GIS and Applications in Geosciences | 40 学时 | 2.5 | 考试 Exam | 6 | |
| PR011044 | 北戴河地质认识实习 Geological Survey Field Trip in Beidaihe | 2 周 | 2 | 考查 Term Paper | 1 夏 | |
| PR012046 | 周口店地质教学实习 Geological Survey Field Trip in Zhoukoudian | 5 周 | 5 | 考查 Term Paper | 2 夏 | |
| PR053073 | 专业实习 Professional Practice | 5 周 | 5 | 考查 Term Paper | 3 夏 | |
| PR053074 | 地下水污染调查评价实践 Practice for Groundwater Contamination Investigation and Evaluation | 2 周 | 2 | 考查 Term Paper | 3 夏 | |
| PR054075 | 毕业设计(论文) Graduation Design (Thesis) | 12 周 | 6 | 考查 Term Paper | 8 | |
| 总计 Total | | 30 周 +168 学时 | 31.5 | | | |

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

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

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

八、毕业要求与培养目标矩阵（工程教育认证类专业）

| 毕业要求 | 培养目标 | | | | 专业能力：掌握地球科学野外工程方法，精通地下水科学与工程的专业技能，具备分析与解决问题的能力，并能通过不断学习适应发展 |
|-------------|------------------------------|----------------------------|---------------------|--|-------------------------------------------------------------|
| | 人文素养：德、智、体、美、劳全面发展，具备较好的人文素质 | 基础知识：具备扎实的数理基础和较强的计算机、外语水平 | 专业知识：掌握地球科学与工程的理论知识 | | |
| 1. 工程知识 | | √ | √ | | |
| 2. 问题分析 | | √ | √ | | √ |
| 3. 设计 / 开发 | | √ | √ | | √ |
| 4. 研究 | | √ | √ | | √ |
| 5. 使用现代工具 | | √ | √ | | √ |
| 6. 工程与社会 | | | √ | | |
| 7. 环境和可持续发展 | | | √ | | |
| 8. 职业规范 | √ | | | | |
| 9. 个人与团队 | √ | | | | |
| 10. 沟通 | √ | | | | |
| 11. 项目管理 | | | | | √ |
| 12. 终身学习 | | | | | √ |

九、课程与毕业要求关系矩阵（工程教育认证专业类专业参考）

| 课程名称 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开发 解决方案 | (4) 研究 | (5) 使用现代 工具 | (6) 工程与社 会 | (7) 环境和可 持续发展 | (8) 职业规范 | (9) 个人和团 队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|----------------------|-------------|-------------|----------------------|-----------|-------------------|------------------|---------------------|-------------|------------------|------------|--------------|--------------|
| 毕业要求 | | | | | | | | | | | | |
| 思想道德与法治 | | | | | | M | | M | H | | | |
| 大学生心理素质教育 | | | | | | | | | H | | | |
| 大学英语 | | | | | | | | | | H | | L |
| 大学英语素质拓展课 | | | | | | | | | | H | | L |
| 体育 | | | | | | | | | H | | | |
| 大学计算机 | H | | | | | | | | | | | |
| 中国近现代史纲要 | | | | | | | | | H | | | |
| 大学生职业生涯规划与就业指导 | | | | | | | | M | | | | M |
| 马克思主义基本原理 | | | | | | | | | H | | | |
| 程序设计基础 | H | | | | | | | | | | | |
| 毛泽东思想和中国特色社会主义理论体系概论 | | | | | | | | | H | | | |
| 习近平新时代中国特色社会主义思想概论 | | | | | | | | | H | | | |
| 形势与政策 | | | | | | | | | | | | |
| 高等数学 | H | | | | | | | | | | | |
| 大学物理 | H | | | | | | | | | | | |
| 大学化学 | H | | | | | | | | | | | |
| 新生研讨 | | | | | | | | | | | | M |
| 专业导论 | | | | | | | | | | | | M |
| 地球科学概论 | H | | | | | | | | | | | |
| 概率论与数理统计 | M | | | | | | | | | | | |
| 线性代数 | M | | | | | | | | | | | |
| 矿物学与岩石学 | M | | | | | | | | | | | |
| 古生物学与地史学 | M | | | | | | | | | | | |
| 构造地质学 | M | | | | | | | | | | | |
| 测量学 A | M | | | | | | | | | | | |
| 第四纪地质学与地貌学 | M | | | | | | | | | | | |

| 课程名称 | 毕业要求 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开发 解决方案 | (4) 研究 | (5) 使用现代 工具 | (6) 工程与社 会 | (7) 环境和可 持续发展 | (8) 职业规范 | (9) 个人和团 队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|--------------|------|-------------|-------------|----------------------|-----------|-------------------|------------------|---------------------|-------------|------------------|------------|--------------|--------------|
| 地下水科学概论 | | H | H | M | H | H | | | | | M | | |
| 水力学 | | M | | | M | | | | | | | | |
| 地下水运动方程 | | M | | M | | | | | | | | | |
| 水文学原理 | | M | | | M | | | | | | | | |
| 地理信息系统 | | M | | | | H | | | | | | | |
| 地下水动力学 | | H | | M | | M | | | | | | | |
| 地下水水化学 | | H | | M | H | | L | | | | | | |
| 工程土质土力学 | | M | M | | M | | | | | | | | |
| 地下水数值模拟 | | M | | | | H | | | | | | | |
| 地下水监测 | | | | H | | M | L | L | | | | | L |
| 地下水资源评价 | | | | H | | | | | L | L | | | L |
| 污染水文地质学 | | | | H | | | L | | | | | | |
| 工程岩体力学 | | M | M | | M | | | | | | | | |
| 地下水勘查 | | | M | H | | | M | M | | | | | L |
| 地下水科学专论 | | | M | M | H | M | | | | | M | | |
| 地下水科学与工程专业英语 | | | | | | | | | | | H | | |
| 生态与环境水文地质学 | | M | | | | | | H | | | | | |
| 地质灾害与防治 | | | | M | | | | L | | L | L | | L |
| 学科前沿课 | | | | | | | | | | | M | | H |
| 工程经济与项目管理 | | | | | | | H | | | | | H | |
| 实验物理 | | L | | | M | | | | | | | | |
| 实验化学 | | L | | | M | | | | | | | | |
| 思想政治社会实践 | | | | | | | | | | L | | | |
| 测量实习 | | M | | | | | | | | | | | |
| 水文地质调查方法设计 | | M | H | H | | | H | | | M | | | |
| 毕业设计(论文) | | | H | H | H | H | H | H | H | | H | H | H |
| 军事理论 | | | | | | | M | | | H | | | |
| 军事技能训练 | | | | | | | | | | H | | | |
| 北戴河地质认识实习 | | L | | | | | | | | | | | |
| 周口店地质教学实习 | | H | | | | | | H | L | M | M | | M |

| 课程名称 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开 发解决方 案 | (4) 研究 | (5) 使用现代 工具 | (6) 工程与社 会 | (7) 环境和可 持续发展 | (8) 职业规范 | (9) 个人和团 队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|-------------|-------------|-------------|--------------------------|-----------|-------------------|------------------|---------------------|-------------|------------------|------------|--------------|--------------|
| 专业要求 | | | | | | | | | | | | |
| 专业实习 | | H | H | | | H | H | M | H | H | | M |
| 地下水污染调查评价实践 | H | H | | H | H | M | M | M | H | H | M | |
| 通识教育选修课程 | | | | | | H | H | H | H | H | H | H |

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

环境工程专业培养方案

一、专业培养目标

本专业面向国家生态文明建设重大需求，培养德、智、体、美、劳全面发展，具备较好的人文素质、扎实的数理化与工程基础和较强的计算机、外语水平，掌握水、土、气、声、固体废物等污染防治和环境规划与资源保护等方面的知识，具备污染控制工程的设计、施工、研发及运营管理能力的专业人才。毕业后可在环境保护相关企业事业单位从事污染防治、环境规划和环境管理等工作。经过5年的实际工作，能够成为专业骨干，具备工程师或与之相当的专业技术能力，并能通过不断学习适应发展。

二、毕业要求

1、工程知识：掌握数学、物理、化学、计算机、环境科学与工程等方面的基础知识、基本原理和基本工作方法；具备分析和解决复杂环境工程问题的知识储备。

2、问题分析：能够应用工程科学的基本原理，进行识别、表达科学问题，并通过中外文文献资料查询、文献检索的基本方法，了解本专业的发展动态；具有一定开展实验设计，创造实验条件，归纳、整理、分析实验结果的能力，能够分析复杂工程问题，以获得有效结论。

3、设计/开发解决方案：能够设计针对不同环境问题的解决方案，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水、土、气、声、固体废物等污染问题进行研究，包括设计实验、分析与解释数据、通过信息综合得到合理有效的结论；初步具备撰写论文，参与学术交流的能力。

5、使用现代工具：能够针对水、土、气、声、固体废物等污染问题，利用新理论、新技术对其进行有效处理，实时追踪环境监测、评价、规划与管理等方面的新理论、新思想、新举措。

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水、土、气、声、固体废物等污染防治方案对社会、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水、土、气、声、固体废物等污染问题的防治方案对环境、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：通过实践教学环节、大学生创新实验计划项目以及毕业设计（论文）等，使学生懂得团队的重要性以及各种角色的责任和义务，培养学生的团队合作与协调意识，能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

10、沟通：能够就水、土、气、声、固体废物等污染问题的防治方案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。较熟练地掌握一门外语，达到国家四级水平，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：理解并掌握环境工程领域的工程管理原理、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。

三、主干学科

环境科学与工程。

四、学制与学位

学制四年，学生修满所规定的最低毕业学分，达到培养目标规定的各项要求后，授予工学学士

学位。

五、核心课程

核心课程包括：给水处理工程、水污染控制工程、土壤与地下水污染控制工程、大气污染控制工程、固体废物处理处置工程、物理学污染控制工程、环境学、环境化学、环境微生物学、水文与水文地质学、水文地球化学、环境评价、环境规划与管理、环境生态学、环境监测、流体力学与流体机械、化工原理、管道工程学、环境工程设计施工与技术经济。

主要实践性教学环节包括：环境工程综合实验、《水质工程学》课程设计、《大气污染控制工程》课程设计、《固体废弃物处理处置工程》课程设计、《环境评价》课程设计、城镇给排水管网设计、建筑给排水设计、泵站设计、测量实习、北戴河地质实习、金工实习、认识实习、生产实习（环境工程综合实习1）、毕业实习（环境工程综合实习2）和毕业论文/设计（环境工程）等。

Undergraduate Program in Environmental Engineering

1. Academic Objectives

Focusing on the major needs of ecological civilization construction of China, the major of Environmental Engineering aims to cultivate professionals that has comprehensive development of moral, intellectual, physical, aesthetic and labor; has good humanistic quality, solid mathematical foundation, strong computer and foreign language levels; has knowledge of pollution prevention and control of water, soil, gas, sound and solid waste, environmental planning and resource protection; has the ability of design, construction, R&D and operation management of pollution control projects. Graduates can work in environmental protection-related enterprises and institutions on pollution prevention and control, environmental planning and resource protection. A graduate can become a professional backbone and hold a middle class professional title of engineer after five years of practical work, and can adapt to development through continuous learning.

2. Graduation Requirements

(1) Engineering knowledge: To master basic knowledge, basic principles and basic working methods in mathematics, physics, chemistry, computer, environmental science and engineering; Have the knowledge reserve to analyze and solve complex environmental engineering problems.

(2) Problem analysis: To be able to apply the basic principles of engineering science, identify and express scientific problems, and pass the basic methods of Chinese and foreign literature inquiry and literature retrieval; Understand the development trend of this major; Have the ability to carry out experimental design, create experimental conditions, summarize, sort out and analyze experimental results, and analyze complex engineering problems to obtain effective conclusions.

(3) Design and develop solutions: To be able to design solutions to different environmental problems, and embody innovative consciousness in the design process, considering social, health, safety, legal, cultural and environmental factors.

(4) Research: To be able to study water, soil, gas, sound, solid waste and other pollution problems based on scientific principles and scientific methods, including designing experiments, analyzing and interpreting data, and obtaining reasonable and effective conclusions through information synthesis; Have the ability to write papers and participate in academic exchanges.

(5) Using modern tools: To have the ability to effectively deal with water, soil, gas, sound, solid waste and other pollution problems by using new theories and technologies, and track new theories, ideas and measures in environmental monitoring, evaluation, planning and management in real time.

(6) Engineering and society: To be able to make reasonable analysis based on the relevant background knowledge of the project, evaluate the impact of professional engineering practice and pollution prevention and control schemes of water, soil, gas, sound and solid waste on society, health, safety, law and culture, and understand the responsibilities.

(7) Environment and sustainable development: To be able to understand and evaluate the impact of prevention and control schemes for water, soil, gas, sound, solid waste and other pollution problems on the sustainable development of the environment and society.

(8) Professional norms: To have humanistic and social science literacy, social responsibility, be able to understand and abide by engineering professional ethics and norms in engineering practice, and fulfill responsibilities.

(9) Individuals and teams: To understand the importance of team and the responsibilities and obligations

of various roles, cultivate students' awareness of team cooperation and coordination, and undertake the roles of individual, team member and person in charge in the team under multidisciplinary background through practical teaching, college students' innovative experimental program and graduation design (thesis).

(10) Communication: To be able to effectively communicate and exchange with peers in the industry and the public on the prevention and control schemes of pollution problems such as water, soil, gas, sound and solid waste, including writing reports and design manuscripts, making statements, expressing clearly or responding to instructions. Proficient in mastering a foreign language, reaching the national level 4, having a certain international perspective, and being able to communicate and communicate under the cross-cultural background.

(11) Project management: To understand and master the engineering management principles and economic decision-making methods in the field of environmental engineering, and be able to apply them in multidisciplinary environments.

(12) Lifelong learning: To have the consciousness of autonomous learning and lifelong learning, and have the ability of continuous learning and adapting to development.

3. Main disciplines

The main discipline is Environmental Science and Technology.

4. Length of Schooling and Degree

Duration of the Program: Four years

Degree Offered: Bachelor of Engineering

5. Core Courses

Core Courses: Feed Water Treatment Engineering, Water Pollution Control Engineering, Soil and Ground Water Pollution Control Engineering, Air Pollution Control Engineering, Solid Waste Treatment and Disposal Engineering, Physics pollution control engineering, Environmentology, Environmental Chemistry, Microbiology for Environmental Engineering, Hydrology and Hydrogeology, Hydrogeochemistry, Environmental Assessment, Environmental Planning and Management, Environmental Ecology, Environmental Monitoring, Hydrodynamics and Hydromachine, Principles of Chemical Engineering, Pipeline Engineering, Environmental Engineering Design-Construction and Economy-Technology.

Major Practice Teaching: Environmental Engineering Comprehensive Experiment, Water Quality Engineering Course Design, Air Pollution Control Engineering Course Design, Solid Waste Treatment and Disposal Engineering, Environmental Assessment Course Design, Design of Municipal Mains Network, Design of Water Supply and Drainage Systems for Building, Design of Bump Station, Surveying Practice, Geological Survey Field Trip in Beidaihe, Metalworking Practice, Cognition Practice, Production Practice (Environmental Engineering Comprehensive Practice I), Graduation Practice (Environmental Engineering Comprehensive Practice II), Undergraduate Dissertation or Project Environmental Engineering, etc.

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

| 课程模块 Course module | 课程类别 Course Classification | 学时数 Hours | 学分 Credits | 学期 Semester | | | | | | | | | | |
|-----------------------------------|----------------------------------------------------|--------------|---------------|-------------|------|----|------|------|----|------|------|----|------|------|
| | | | | 1 | 2 | 1夏 | 3 | 4 | 2夏 | 5 | 6 | 3夏 | 7 | 8 |
| 通识教育 Liberal Education | 通识教育必修课程 Required Courses of General Education | 746 | 41 | 11.25 | 9.25 | | 8.25 | 5.25 | 1 | 3.25 | 1.25 | | 0.25 | 0.25 |
| | 通识教育选修课程 Selective Courses of General Education | 192 | 12 | | | | | | | | | | | |
| 专业教育 Professional Education | 学科基础课程 Disciplinary Fundamental Courses | 872 | 54.5 | 12 | 10 | | 13 | 9.5 | | 7.5 | 2.5 | | | |
| | 专业核心课程 Specialized Fundamental Courses | 432 | 27 | | | | | 6 | | 8 | 9 | | 4 | |
| | 专业拓展课程 Specialized Development | 192 | 12 | | 4 | | | 2 | | 6 | | | | |
| 实践教育 Practical Education | 课程实践 Course Practice | 38周+128学时 | 38 | | 3 | 5 | 1 | 4 | 5 | 2 | | 5 | 3 | 9 |
| | 课外实践 Extracurricular practice | | 6 | | | | | | | | | | | |
| 必修课总学分 Required course credits | | | | 159.5 | | | | | | | | | | |
| 选修课总学分 Elective course credits | | | | 29 | | | | | | | | | | |
| 最低毕业总学分 Total Credits | | | | 187.5 | | | | | | | | | | |

七、课程设置 (Curriculum)

1、通识教育必修课程 (Required Courses of General Education): 746 学时 (746 Hours), 41 学分 (41 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR181009 | 思想道德与法治 Ideological Morality and Rule of Law | 48 | 3 | 40 | 8 | | 考试 Exam | 1 | |
| GR181008 | 中国近现代史纲要 Essentials of Modern Chinese History | 48 | 3 | 40 | 8 | | 考试 Exam | 2 | |
| GR182014 | 马克思主义基本原理 Fundamental Principles of Marxism | 48 | 3 | 40 | 8 | | 考试 Exam | 3 | |
| GR182024 | 毛泽东思想和中国特色社会主义理论体系概论 Introduction to Mao Zedong Thoughts and Theoretical System of the Chinese Characteristic Socialism | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| GR182022 | 习近平新时代中国特色社会主义思想概论 Introduction to Xi Jinping Thoughts on Socialism with Chinese Characteristics in the New Era | 48 | 3 | 48 | | | 考试 Exam | 5 | |
| GR181013 | 形势与政策 (1) Situation and Policy (1) | 4 | 0.25 | 4 | | | 考查 Term Paper | 1 | |
| GR181014 | 形势与政策 (2) Situation and Policy (2) | 4 | 0.25 | 4 | | | 考查 Term Paper | 2 | |
| GR181015 | 形势与政策 (3) Situation and Policy (3) | 4 | 0.25 | 4 | | | 考查 Term Paper | 3 | |
| GR181016 | 形势与政策 (4) Situation and Policy (4) | 4 | 0.25 | 4 | | | 考查 Term Paper | 4 | |
| GR181017 | 形势与政策 (5) Situation and Policy (5) | 4 | 0.25 | 4 | | | 考查 Term Paper | 5 | |
| GR181018 | 形势与政策 (6) Situation and Policy (6) | 4 | 0.25 | 4 | | | 考查 Term Paper | 6 | |
| GR181019 | 形势与政策 (7) Situation and Policy (7) | 4 | 0.25 | 4 | | | 考查 Term Paper | 7 | |
| GR181020 | 形势与政策 (8) Situation and Policy (8) | 4 | 0.25 | 4 | | | 考查 Term Paper | 8 | |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|------------------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| GR301004 | 大学生职业生涯规划与就业指导(1) Career Planning and Employment Guidance for University Students (1) | 20 | 1 | 16 | 4 | | 考试 Exam | 2 | |
| GR303005 | 大学生职业生涯规划与就业指导(2) Career Planning and Employment Guidance for University Students (2) | 18 | 1 | 12 | 6 | | 考试 Exam | 6 | |
| GR301005 | 大学生心理素质教育(1) Mental Health (1) | 16 | 1 | 16 | | | 考查 Term Paper | 1 | |
| GR303006 | 大学生心理素质教育(2) Mental Health (2) | 16 | 1 | 16 | | | 考查 Term Paper | 5 | |
| GR302008 | 军事理论 Military Theory | 36 | 1 | 36 | | | 考试 Exam | 3 | |
| GR081071 | 大学英语(1) College English (1) | 64 | 4 | 64 | | | 考试 Exam | 1 | |
| GR081072 | 大学英语(2) College English (2) | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR081067 | 大学英语素质拓展课 Competence-oriented Education for College English | 32 | 2 | 32 | | | 考试 Exam | 2 | |
| GR141005 | 体育(1)(系列课程) Physical Education (1) | 32 | 1 | | 32 | | 考试 Exam | 1 | |
| GR141006 | 体育(2)(系列课程) Physical Education (2) | 32 | 1 | | 32 | | 考试 Exam | 2 | |
| GR141007 | 体育(3)(系列课程) Physical Education (3) | 32 | 1 | | 32 | | 考试 Exam | 3 | |
| GR141008 | 体育(4)(系列课程) Physical Education (4) | 32 | 1 | | 32 | | 考试 Exam | 4 | |
| GR041001 | 大学计算机 College Computer | 32 | 2 | 16 | 16 | | 考试 Exam | 1 | |
| GR041003 | 程序设计基础A Fundamentals of Programming A | 64 | 4 | 24 | 24 | 16 | 考试 Exam | 3 | |
| 总计 Total | | 746 | 41 | 512 | 218 | 16 | | | |

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

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

3、学科基础课程 (Disciplinary Fundamental Courses): 872 学时 (872 Hours), 54.5 学分 (54.5 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR191001 | 高等数学 A (1) Advanced Mathematics A (1) | 96 | 6 | 96 | | | 考试 Exam | 1 | |
| DR191011 | 无机化学 Inorganic Chemistry | 48 | 3 | 48 | | | 考试 Exam | 1 | |
| DR021002 | 工程图学 Engineering Graphics | 48 | 3 | 48 | | | 考试 Exam | 1 | |
| DR191002 | 高等数学 A (2) Advanced Mathematics A (2) | 96 | 6 | 96 | | | 考试 Exam | 2 | |
| DR191008 | 大学物理 (1) College Physics (1) | 48 | 3 | 48 | | | 考试 Exam | 2 | |
| DR050018 | 环境工程专业导论 Introduction to Environmental Engineering | 16 | 1 | 16 | | | 考查 Term Paper | 1 | 必选 1 学 分 |
| DR192005 | 线性代数 Linear Algebra | 32 | 2 | 32 | | | 考试 Exam | 3 | |
| DR192017 | 物理化学 B Physical Chemistry B | 48 | 3 | 48 | | | 考试 Exam | 3 | |
| DR042127 | 电工电子技术 B Electrical and Electronic Technology B | 48 | 3 | 18 | 14 | 16 | 考试 Exam | 3 | 16 学时线 上 |

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|----------------------------------------------------------------------------|--------------|---------------|----------------|--------------------|----------------|--------------------|------------------|-------------|
| DR192009 | 大学物理 (2) College Physics (2) | 48 | 3 | 48 | | | 考试 Exam | 3 | |
| DR052004 | 流体力学与流体机械 Hydrodynamics and Hydromachine | 32 | 2 | 32 | | | 考试 Exam | 3 | |
| DR192006 | 概率论与数理统计 Probability and Mathematics Statistics | 48 | 3 | 48 | | | 考试 Exam | 4 | |
| DR052001 | 分析化学 (环境工程类) Analytical Chemistry (For Environmental Engineering) | 32 | 2 | 24 | 8 | | 考试 Exam | 4 | |
| DR122001 | 测量学 A Surveying A | 40 | 2.5 | 24 | 16 | | 考试 Exam | 4 | |
| DR052091 | 环境工程原理 Principles of Environmental Engineering | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| DR052002 | 有机化学 (环境类) Organic Chemistry (For Environmental Engineering) | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| DR053006 | 环境生态学 Environmental Ecology | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| DR021029 | 工程力学 Engineering Mechanics | 56 | 3.5 | 52 | 4 | | 考试 Exam | 5 | |
| DR053092 | 土建项目管理与技术经济 Civil engineering project management and Economy-Technology | 40 | 2.5 | 40 | | | 考试 Exam | 6 | |
| 总计 Total | | 872 | 54.5 | 814 | 42 | | | | |

4、专业核心课程 (Specialized Core Courses): 448 学时 (448 Hours), 30 学分 (30 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|---------------------------------------------------------------|--------------|---------------|----------------|--------------------|----------------|--------------------|------------------|-------------|
| SR052017 | 管道工程 Pipeline Engineering | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| SR052024 | 环境监测 Environmental Monitoring | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| SR053020 | 环境学 Environmentology | 32 | 2 | 32 | | | 考试 Exam | 4 | |
| SR053021 | 环境化学 Environmental Chemistry | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053014 | 给水处理工程 Water Supply Treatment Engineering | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053026 | 环境管理 Environmental Management | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053029 | 环境工程专业英语 Specialized English for Environmental Engineering | 32 | 2 | 32 | | | 考试 Exam | 5 | |
| SR053028 | 物理性污染控制 Physical Pollution Control | 32 | 2 | 32 | | | 考试 Exam | 6 | |
| SR053093 | 环境科学与工程前沿 Frontiers of Environmental Science & Engineering | 16 | 1 | 16 | | | 考试 Exam | 6 | |
| SR053018 | 水污染控制工程 Water Pollution Control Engineering | 48 | 3 | 48 | | | 考试 Exam | 6 | 在环境微生物学后开课 |
| SR053022 | 大气污染控制工程 Air Pollution Control Engineering | 32 | 2 | 32 | | | 考试 Exam | 6 | |
| SR054025 | 环境微生物学 Microbiology for Environmental Engineering | 32 | 2 | 32 | | | 考试 Exam | 7 | |
| SR054019 | 环境评价 Environmental Assessment | 32 | 2 | 32 | | | 考试 Exam | 7 | |
| SR054019 | 固体废物处理处置工程 Solid Waste Treatment and Disposal Engineering | 32 | 2 | 32 | | | 考试 Exam | 7 | |
| 总计 Total | | 448 | 30 | 448 | | | | | |

5、专业拓展课程 (Specialized Development Courses): 192 学时 (192 Hours), 12 学分 (12 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 总学时 Hours | 学分 Credits | 讲课学时 Lecture | 实验学时 Experiment | 线上学时 Online | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|--------------------------------------------------------------------------------|--------------|---------------|-----------------|--------------------|----------------|--------------------|------------------|------------------|
| DR011036 | 地球科学概论 Introduction to Earth Science | 64 | 4 | 32 | 32 | | 考试 Exam | 2 | 必选 |
| SS053094 | 水文与水文地质学 (环境工程类) Hydrology and Hydrogeology (For Environmental Engineering) | 48 | 3 | 48 | | | 考试 Exam | 6 | 必选 |
| DR054005 | 水文地球化学 (环境类) Hydrogeochemistry (For Environmental Engineering) | 32 | 2 | 32 | | | 考试 Exam | 5 | 必选 |
| SR053016 | 土壤与地下水污染控制工程 Soil and Groundwater Pollution Control Engineering | 32 | 2 | 32 | | | 考试 Exam | 6 | 在水质工程 II 后开课, 必选 |
| SS050040 | 水文地质学进展 Advances in Hydrogeology | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050041 | 现代水文水资源的研究前沿 Research frontiers of modern hydrology and water resources | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050076 | 土壤 / 地下水污染修复前沿 Advances in soil/groundwater remediation | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS014130 | 地球关键带研究前沿 Research Frontiers of Earth Critical Zone | 16 | 1 | | | | 考查 Term Paper | 6 | 六选一 |
| SS050042 | 环境科学与工程学科前沿 Frontiers of Environmental Science and Engineering | 16 | 1 | | | | 考查 Term Paper | 6 | |
| SS050079 | 地下水模拟不确定性分析 Uncertainty Analysis for Groundwater Flow Modeling | 16 | 1 | | | | 考查 Term Paper | 6 | |
| 总计 Total | | 192 | 12 | 144 | 32 | | | | |

6、课程实践 (Course Practice): 38 周 +128 学时 (38 weeks and 128 hours), 37 学分 (37 Credits)

| 课程代码 Course Code | 课程名称 Course Name | 周数 (学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-----------------------------------------------------------------------------------------------|-----------------------|---------------|--------------------|------------------|-------------|
| PR311003 | 军事技能训练 Military Theory and Practice | 2 周 | 1 | 考查 Term Paper | 1 | |
| PR181010 | 思想政治社会实践 Political Social Practice | 32 学时 | 2 | 考试 Exam | 1 夏 | |
| PR011044 | 北戴河地质实习 Geological Survey Field Trip in Beidaihe | 2 周 | 2 | 考查 Term Paper | 1 夏 | |
| PR051095 | 专业认识实习 Major Introductory Practice | 2 周 | 2 | 考查 Term Paper | 1 夏 | |
| PR022152 | 金工实习 (2) Metalworking Practice | 1 周 | 1 | 考查 Term Paper | 2 夏 | |
| PR052096 | 环境工程基础实验 Environmental Engineering basic Experiment | 2 周 | 2 | 考查 Term Paper | 2 夏 | |
| PR191045 | 实验物理 (1) Physics Experiments (1) | 24 学时 | 1 | 考试 Exam | 2 | |
| PR191047 | 实验化学 Chemistry Experiments | 48 学时 | 2 | 考试 Exam | 2 | |
| PR192046 | 实验物理 (2) Physics Experiments (2) | 24 学时 | 1 | 考试 Exam | 3 | |
| PR053097 | 环境工程专业实验 Environmental Engineering Professional Experiment | 2 周 | 2 | 考查 Term Paper | 3 夏 | |
| PR053098 | 环境工程特色实验 Environmental Engineering characteristic Experiment | 1 周 | 1 | 考查 Term Paper | 3 夏 | |
| PR053099 | 生产实习 (环境工程综合实习 1) Production Practice (Environmental Engineering Comprehensive Practice 1) | 2 周 | 2 | 考查 Term Paper | 3 夏 | |
| PR052054 | 建筑给排水设计 Building Water Supply and Drainage Design | 1 周 | 1 | 考查 Term Paper | 4 | |
| PR052055 | 城镇给排水管网设计 Design of Municipal Mains Network | 1 周 | 1 | 考查 Term Paper | 4 | |

| 课程代码 Course Code | 课程名称 Course Name | 周数(学时) Week(hour) | 学分 Credits | 考核方式 Assessment | 开课学期 Semester | 备注 Notes |
|---------------------|-------------------------------------------------------------------------------------------------|----------------------|---------------|--------------------|------------------|-------------|
| PR052056 | 泵站设计 Design of Bump Station | 1周 | 1 | 考查 Term Paper | 4 | |
| PR122059 | 测量实习 Surveying Practice | 1周 | 1 | 考查 Term Paper | 4 | |
| PR053057 | 《给水处理工程》课程设计 Water Supply and Treatment Course Design | 2周 | 2 | 考查 Term Paper | 5 | |
| PR054058 | 《大气污染控制工程》课程设计 Air Pollution Control Engineering Course Design | 1周 | 1 | 考查 Term Paper | 7 | |
| PR054059 | 《固体废物处理处置工程》课程设计 Solid Waste Treatment and Disposal Engineering Course Design | 1周 | 1 | 考查 Term Paper | 7 | |
| PR054060 | 《环境影响评价》课程设计 Environmental Assessment Course Design | 1周 | 1 | 考查 Term Paper | 7 | |
| PR054063 | 毕业实习(环境工程综合实习2) Graduation Practice (Environmental Engineering Comprehensive Practice II) | 3周 | 3 | 考查 Term Paper | 8 | |
| PR054064 | 毕业设计(论文) Graduation Design (Thesis) | 12周 | 6 | 考查 Term Paper | 8 | |
| 总计 Total | | 38周+128学时 | 37 | | | |

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

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

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

八、毕业要求与培养目标矩阵

| 毕业要求 | 培养目标 | | | |
|-------------|------------------------------|---------------------------------|------------------------------------------|--------------------------------------------|
| | 人文素养：德、智、体、美、劳全面发展，具备较好的人文素质 | 基础知识：具备扎实的数理化学与工程基础和较强的计算机、外语水平 | 专业知识：掌握水、土、气、声、固体废物等污染防治和环境规划与资源保护等方面的知识 | 专业能力：具备污染控制工程的设计、施工、研发及运营管理能力，并能通过不断学习适应发展 |
| 1. 工程知识 | | √ | √ | |
| 2. 问题分析 | | √ | √ | √ |
| 3. 设计 / 开发 | | √ | √ | √ |
| 4. 研究 | | √ | √ | √ |
| 5. 使用现代工具 | | √ | √ | √ |
| 6. 工程与社会 | | √ | √ | √ |
| 7. 环境和可持续发展 | | √ | √ | √ |
| 8. 职业规范 | √ | √ | | √ |
| 9. 个人与团队 | √ | √ | | √ |
| 10. 沟通 | √ | | √ | √ |
| 11. 项目管理 | | | | √ |
| 12. 终身学习 | | | | √ |

九、课程与毕业要求关系矩阵

| 课程名称 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开发解决方案 | (4) 研究 | (5) 使用现代工具 | (6) 工程与社会 | (7) 环境和可持续发展 | (8) 职业规范 | (9) 个人和团队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|----------------------|-------------|-------------|------------------|-----------|---------------|--------------|-----------------|-------------|--------------|------------|--------------|--------------|
| 思想道德与法治 | | | | | | | | H | | L | | H |
| 毛泽东思想和中国特色社会主义理论体系概论 | | | | | | | | H | | | | H |
| 中国近现代史纲要 | | | | | | | | L | | | | L |
| 马克思主义基本原理 | | | | | | | | M | | | L | M |
| 习近平新时代中国特色社会主义思想概论 | | | | | | | H | | | | | H |
| 思想政治社会实践 | | | | H | | | | | | M | | |
| 形势与政策 | | | | | | | | M | | M | | |
| 大学生心理素质教育 | | | | | | | | | H | L | | L |
| 大学英语 | | | | | | | | | | H | | L |
| 大学英语素质拓展课 | | | | | | | | | | H | | L |
| 体育 | | | | | | | | | L | | | H |
| 大学计算机 | | | | | H | | | | | M | H | |
| 程序设计基础 | | | | | M | H | | | | | | |
| 大学生职业发展与就业指导 | | | | | | | | | M | | | M |
| 新生研讨课 | | | | | | | | | L | | | |
| 军事技能训练 | | | | | | | | | H | | | |
| 军事理论 | | | | | | M | | | M | | | |
| 高等数学 | | | | | | | | | | | | |
| 线性代数 | | | | | | | | | | | | |
| 概率论与数理统计 | | | | | | | | | | | | |
| 大学物理 | | | | | | | | | | | | |
| 无机化学 | | | | | | | | | | | | |
| 分析化学(环境工程类) | H | | | | | | | | | | | |
| 有机化学(环境工程类) | H | | | | | | | | | | | |
| 物理化学 | H | | | | | | | | | | | |

| 课程名称 | 毕业要求 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开 发解决方 案 | (4) 研究 | (5) 使用现代 工具 | (6) 工程与社 会 | (7) 环境和可 持续发展 | (8) 职业规范 | (9) 个人和团 队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|---------------------|------|-------------|-------------|--------------------------|-----------|-------------------|------------------|---------------------|-------------|------------------|------------|--------------|--------------|
| 工程图学 | | | | | | M | | | | | | | |
| 电工电子技术 | | | | | L | | | | | | | | |
| 测量学 | L | | | | | H | | | | | | | |
| 工程力学 | | | | | M | | | | | | | | |
| 环境工程原理 | H | | | | M | | | | | | | | |
| 流体力学与流体机械 | M | | | | | | | | | | | | |
| 环境生态学 | M | | | | | | | M | | | | | |
| 专业导论课 | | | | | | | | | | L | | | |
| 土建项目管理与技术经济 | | | | M | | | | | | | | | |
| 给水处理工程 | H | | | H | | | L | L | | | | | |
| 水污染控制工程 | H | | | H | | | H | M | | | | | |
| 管道工程学 | M | | | | | | M | | | | | | |
| 大气污染控制工程 | H | | | M | | | H | M | | | | | |
| 固体废物处理处置工程 | M | | | M | | | | M | | | | | |
| 环境学 | M | | | | | | L | | | | | | |
| 环境化学 | M | | | | | | L | | | | | | |
| 环境微生物学 | M | | | | | | L | | | | | | |
| 环境监测 | M | | | | | | L | | | | | | |
| 环境影响评价 | M | | | | | | L | | | | | | |
| 环境管理 | M | | | | | | L | | | | | | |
| 物理性污染控制 | M | | | | | | L | | | | | | |
| 环境科学与工程学科前沿 | L | | | | | | | | | | | | |
| 环境工程专业英语 | | | | | | | | | | | | | |
| 水文与水文地质学（环境工 程类） | M | | H | M | M | | M | M | | | M | | M |
| 水文地球化学 | M | | H | | M | | L | M | L | | | | |
| 地球科学概论 | H | | | | | | | | | | | | |
| 土壤与地下水污染控制工程 | H | | | | | | | | | | | | |

| 课程名称 | 毕业要求 | (1) 工程知识 | (2) 问题分析 | (3) 设计/开发解决方案 | (4) 研究 | (5) 使用现代工具 | (6) 工程与社会 | (7) 环境和可持续发展 | (8) 职业规范 | (9) 个人和团队 | (10) 沟通 | (11) 项目管理 | (12) 终身学习 |
|--------------------|------|----------|----------|---------------|--------|------------|-----------|--------------|----------|-----------|---------|-----------|-----------|
| 金工实习 | | | | | | | L | | | L | | | |
| 环境工程基础实验、专业实验、特色实验 | H | | | | | | H | | | | | | |
| 建筑给排水设计 | | H | | | | M | H | | | L | | | |
| 城镇给排水管网设计 | | H | | | | M | H | | | | | | |
| 泵站设计 | | M | | | | M | M | | | | | | |
| 《给水处理工程》课程设计 | | M | | H | | | | | | | | | |
| 《大气污染控制工程》课程设计 | | M | | H | | | | | | | | | |
| 《固体废物处理处置工程》课程设计 | | M | | H | | | | | | | | | |
| 《环境影响评价》课程设计 | | M | | H | | | | | | | | | |
| 军事理论及训练 | | | | | | | | | | L | | | |
| 北戴河地质实习 | | | | | | | M | | | L | | | |
| 专业认识实习 | | | | | | | L | | | L | | | |
| 测量实习 | | | | | | | L | | | L | | | |
| 生产实习（环境工程综合实习 I） | | | | | | | | | | L | | | |
| 毕业实习（环境工程综合实习 II） | | | | | | | | | | L | | | |
| 毕业论文 / 设计（环境工程） | M | | | | | | | | | | | | |
| 思想政治社会实践 | | | | | | | H | | | | | | L |
| 实验物理 | L | | | | | | | | | | | | |
| 实验化学 | L | | | | | | | | | | | | |
| 通识教育选修课程 | | | | | | | H | | | H | H | H | H |

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