# 水文与水资源工程专业培养方案

**专业名称与代码：** 水文与水资源工程　　080802（081102）

**专业培养目标：**培养适应现代化建设和未来社会与科技发展需要，立志为国家富强、民族振兴和人类文明进步而奋斗，德智体美全面发展与健康个性和谐统一的、富有创新精神、实践能力和国际视野的高素质工程技术复合型人才和科学研究人才。

学生毕业后具备较高的道德文化修养和扎实的自然科学知识，较强的外语、计算机、管理等方面的能力；掌握水资源及水环境（尤其是地下水及其环境）方面的专业基础知识和专业理论，能从事地表水、地下水资源及水环境保护的勘测、规划设计、预测、评价与管理等方面的研究和开发。毕业后可到国家各部委、科研院所、勘察设计单位及高等院校等从事工程技术、科学研究及教学工作，可继续攻读水文学及水资源专业的硕士、博士学位。

**专业培养要求：**本专业学生将在牢固掌握理科基础、外语、计算机技能的基础上，主要学习水文水资源及环境信息的采集及处理、水旱灾害预测及防治、水资源规划、地下水渗流等方面基本理论和基本知识，受到工程制图、运算、实验、测试等方面基本训练，具有应用所学专业分析解决实际问题、科学研究、组织管理的基本能力。

**毕业生应获得以下几方面的知识和能力：**

1．掌握数学、物理、化学、水力学、水文学等方面基础理论、基础知识；

2．掌握水文水资源、水环境有关的基础理论、基础知识和分析、设计方法；

3．具有从事工程规划、勘测、设计、科学研究和组织管理的基本技能；

4．熟悉国家的方针、政策和法规；

5．了解水文水资源及水环境领域的发展动态；

6．掌握文献检索、资料查询的基本方法，具有初步的科学研究和实际工作能力。

**主干学科：**地质工程、土木工程、水利工程、环境工程。

**核心课程：**水力学、水文学原理与水文测验、水文地质学基础、地下水动力学、水文地球化学/附水分析、水文统计与水文计算、流域水文模型、生态水文学、水资源开发与保护等。

**主要专业实验：**水力学实验、水文地质学基础实验、地下水动力学实验、环境水化学实验、水分析化学实验等。

**主要实践性教学环节：**工程测量实习、北戴河地质认识实习、周口店地质教学实习，三峡专业教学实习、计算机语言编程课程设计、水文预报课程设计、地下水开发与防治课程设计、毕业实习与毕业设计等约33～34周。

**修业年限：**四年。

**授予学位：**工学学士。

**相近专业：**环境工程、地质工程、地下水科学与工程。

# Program For Hydrology and Water Resources Engineering

**Specialty and Code:** Hydrology and Water Resources Engineering 080802（081102）

**Education Objective:** It is to foster engineers and specialists in the field of hydrology and water resources. The graduates will have not only good background of natural sciences, foreign language, computer application and management, but also specialized knowledge in water resources and environment (especially in groundwater and environment). The graduates can engage in investigating, forecasting, evaluating and managing of surface water, groundwater and environmental protection in government departments, scientific research institutes, universities, and reconnaissance and design sectors and also can continue to study for Master's degree and Doctor's degree.

**Education Requirements:** Based on the master the knowledge of natural science, a foreign language and computer applications, students will acquire the knowledge and technology for the data collecting and processing of hydrology and water resources, aquatic environment, forecasting of water logging and drought, water resources planning, groundwater seepage and others related skills. Students should have the ability to solve practical engineering problems, engaged in scientific research, organizing and managing.

**Graduates Are Required:**

1. To grasp the basic knowledge of mathematics, physics, chemistry, hydraulics and hydrology.
2. To grasp the basic theory, analyzing and designing methods about hydrology and water resources, aquatic environment.
3. To possess the ability to engage in engineering planning, investigating, designing, scientific research, organizing and managing.
4. To be proficient with policies and regulations regarding hydrology and water resources.
5. To know about the development and future in the field of hydrology and water resources, aquatic environment.
6. To grasp the basic methods of literature search and information acquisition; possess the essential ability engaging in scientific researching.

**Major Disciplines:** Geotechnical Engineering, Civil Draulic**,** Hydraulic Engineering and Environmental Engineering.

**Main Courses:** Hydraulics，The Principles of Hydrology & Gauging，The Fundamental of Hydrogeology，River Dynamics，Groundwater Hydraulics，Hydro-Geochemistry，Hydrological Statistic and Analysis， Watershed Hydrologic Model，Eco-hydrology，Water Resources Exploitation and Protection.

**Lab Experiments:** Hydraulic Testing, Hydrodynamics Testing, Hydrochemistry Testing, Soil

Mechanics Testing, Phreatic Water and Confined Water Simulation, Groundwater Flow Net Simulation.

**Practical Work:** Engineering Survey Practice, Cognitive Geological Field Practice (at Beidaihe), Instructive Practice in Geology (at Zhoukoudian), Instructive Practice for Major (at the Three Gorges), Computer Program Design Practice, Hydrological Forecast Course Project Design，Hydrological Forecast Course Project Design，Graduation Practice and Design. All the Above Field Practice Will Require 33~ 34 Weeks.

**Duration:** Four years.

**Degree Granted:** Bachelor of Science.

**Related Specialties:** Enviromental Engineering, Geotechnical Engineering, and Groundwater Science and Engineering.

# 水文与水资源工程专业课程教学计划表

## Course Descriptions of Hydrology and Water Resources Engineering

| 课程类别 Classi-fication | | 课程编号 Code | 课程名称 Course Name | 学分 Crs | 学时 Hrs | 学时分类 Class Hours | | 学期学分分配 Semester Credits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 讲课 Lec. | 实验 Lab. | 一 1st | 二 2nd | 三 3rd | 四 4th | 五 5th | 六 6th | 七 7th | 八 8th |
| 通识教育课 Liberal Education Courses | 必修 Compulsory | 11706200 | 马克思主义基本原理 Principles of Marxism | 3 | 48 | 48 | | 3 | | | | | | | |
| | | 11706500 | 毛泽东思想与中国特色社会主义理论体系概论 Mao Tse-tung Thought and Introduction to the Theoretical System of Socialism with Chinese Characteristics | 4 | 64 | 64 | | | | 4 | | | | | |
| | | 11711800 | 中国近现代史纲要 The Essentials of Modern Chinese History | 2 | 32 | 32 | | | | | 2 | | | | |
| | | 120002＊0 | 思想道德修养与法律基础 Morality Education and Fundamentals of Law | 3 | 48 | 48 | | 1.5 | 1.5 | | | | | | |
| | | 113027＊0 | 体育 Physical Education | 6 | 96 | 96 | | 1.5 | 1.5 | 1.5 | 1.5 | | | | |
| | | 109005＊0 | 大学英语 College English | 12 | 192 | 192 | | 2.5 | 2.5 | 3.5 | 3.5 | | | | |
| | | 11904100 | 计算机高级语言程序设计（C） Computer High-level Language（C） | 3.5 | 56 | 40 | 16 | | 3.5 | | | | | | |
| | | 20413200 | 水资源与环境专业导论 Introduction to Groundwater and Environmental Sciences | 1 | 16 | 16 | | 1 | | | | | | | |
| | | 14300100 | 军事理论 Military Theory | 2 | 32 | 32 | | 2 | | | | | | | |
| | 选修 Elective | TX35000Z | 自然科学类 Natural Science | 2 | 32 | | | | | | | | | | |
| | | TX35000G | 工程技术类 Engineering | 2 | 32 | | | | | | | | | | |
| | | TX35000S | 社会科学类 Social Science | 2 | 32 | | | | | | | | | | |
| | | TX35000R | 人文艺术类 Humanities & Arts | 2 | 32 | | | | | | | | | | |
| | | TX35000J | 经济管理类 Economy & Management | 2 | 32 | | | | | | | | | | |
| | | | 其他类 Other Courses | 2 | 32 | | | | | | | | | | |
| | | **小计 Sum** | | **48.5** | **776** | **760** | **16** | **11.5** | **9** | **9** | **7** | | | | |

| 课程类别 Classi-fication | 课程编号 Code | 课程名称 Course Name | 学分 Crs | 学时 Hrs | 学时分类 Class Hours | | 学期学分分配 Semester Credits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 讲课 Lec. | 实验 Lab. | 一 1st | 二 2nd | 三 3rd | 四 4th | 五 5th | 六 6th | 七 7th | 八 8th |
| 学科基础课 Disciplinary Fundamental Courses | 212028*2 | 高等数学 B<br>Advanced Mathematics B | 11 | 176 | 176 | | 4.5 | 6.5 | | | | | | |
| | 21206300 | 数学实验<br>Mathematics Experiments | 1 | 16 | | 16 | | 1 | | | | | | |
| | 212093*0 | 大学物理 C<br>College Physics C | 7 | 112 | 112 | | | 3.5 | 3.5 | | | | | |
| | 212092*2 | 物理实验 B<br>Physical Experiments B | 3.5 | 56 | | 56 | | 2 | 1.5 | | | | | |
| | 20302403 | 大学化学 C<br>College Chemistry C | 4 | 64 | 50 | 14 | | | 4 | | | | | |
| | 21208803 | 线性代数 C<br>Linear Algebra C | 2.5 | 40 | 40 | | | 2.5 | | | | | | |
| | 21209602 | 概率论与数理统计 B<br>Probability and Mathematics Statistics B | 3 | 48 | 48 | | | | 3 | | | | | |
| | 21114302 | 测量学 B<br>Surveying B | 2.5 | 40 | 40 | | 2.5 | | | | | | | |
| | 20508002 | 工程力学 B<br>Engineering Mechanic B | 5 | 80 | 72 | 8 | | | | 5 | | | | |
| | 20714600 | 建筑制图<br>Architecture Drawing | 3.5 | 56 | 44 | 12 | | | | 3.5 | | | | |
| | 20105300 | 普通地质学<br>Physical Geology | 3 | 48 | 48 | | | 3 | | | | | | |
| | 20105200 | 矿物岩石学<br>Mineralogy and Lithology | 2.5 | 40 | 40 | | | | 2.5 | | | | | |
| | 20104002 | 构造地质学 B<br>Structure Geology B | 3 | 48 | 48 | | | | | 3 | | | | |
| | 20101600 | 地貌学及第四纪地质学<br>Geomorphology and Quaternary Geology | 2.5 | 40 | 40 | | | | | 2.5 | | | | |
| | 20714703 | 电工及电子技术 C<br>Electrician and Electron Technology C | 4 | 64 | 54 | 10 | | | | | 4 | | | |
| | **小计 Sum** | | **58** | **928** | **812** | **116** | **7** | **18.5** | **14.5** | **14** | **4** | | | |
| 专业主干课 Main Specialty Courses | 20408400 | 水力学<br>Hydraulics | 2.5 | 40 | 32 | 8 | | | | 2.5 | | | | |
| | 20409600 | 水文学原理及水文测验<br>The Principles of Hydrology | 3 | 48 | 32 | 8 | | | | 3 | | | | |
| | 20409101 | 水文地质学基础 A<br>The Fundamental of Hydrogeology A | 4 | 64 | 40 | 24 | | | | | 4 | | | |
| | 20400801 | 地下水动力学 A<br>Groundwater Hydraulics A | 4 | 64 | 40 | 24 | | | | | | 4 | | |
| | 20408800 | 水文地球化学/附水分析<br>Hydro-Geochemistry | 3 | 48 | 36 | 12 | | | | | | 3 | | |
| | 20414600 | 水文统计及水文计算<br>Hydrological Statistic and Analysis | 3 | 48 | 48 | | | | | | 3 | | | |

| 课程类别 Classi-fication | 课程编号 Code | 课程名称 Course Name | 学分 Crs | 学时 Hrs | 学时分类 Class Hours | | 学期学分分配 Semester Credits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 讲课 Lec. | 实验 Lab. | 一 1st | 二 2nd | 三 3rd | 四 4th | 五 5th | 六 6th | 七 7th | 八 8th |
| | 20414400 | 水文地质工程地质勘察方法 Investigation and Survey skills for groundwater and geoengineering | 2.5 | 40 | 40 | | | | | | | 2.5 | | |
| | 20414200 | 水资源开发与保护 Water Resources Exploitation and Protection | 1.5 | 24 | 24 | | | | | | | 1.5 | | |
| | 20414300 | 工程水文地质学 Engineering Hydrogeology | 2.5 | 40 | 40 | | | | | | | 2.5 | | |
| | 20406500 | 流域水文模型 Watershed Hydrologic Model | 2.5 | 40 | 40 | | | | | | | 2.5 | | |
| | 21100700 | GIS 原理与应用 Principles & Applications of GIS (Bilingual) | 2.5 | 40 | 30 | 10 | | | | | | | 2.5 | |
| | 20407300 | 生态水文学 Eco-hydrology | 2 | 32 | | | | | | | | | 2 | |
| | 20401400 | 地下水数值模拟基础 Groundwater Modeling | 2.0 | 32 | 20 | 12 | | | | | | | 2 | |
| | **小计 Sum** | | **35** | **560** | **422** | **98** | **0** | **0** | **0** | **5.5** | **7** | **16** | **6.5** | |
| **专业选修课 Specialty Elective Courses** | | 具体见专业选修课列表 | 16 | 256 | | | | | | | 6 | 4.5 | 5.5 | |
| **合计 Sub-total** | | | **157.5** | **2520** | **1994** | **230** | **18.5** | **27.5** | **23.5** | **26.5** | **17** | **20.5** | **12** | |
| **实践环节 Practical Work** | 40000100 | 劳动教育 Labor Education | 1 | 1 周 | | | 1 | | | | | | | |
| | 44300200 | 军事训练 Military Training | 2 | 2 周 | | | 2 | | | | | | | |
| | 41904300 | 计算机高级语言课程设计(C) Course Design for Computer High-Level Language (C) | 2 | 1.5 周 | | | | 2 | | | | | | |
| | 41114401 | 测量教学实习 A Surveying Practice A | 1.5 | 1 周 | | | 1.5 | | | | | | | |
| | 40103300 | 地质认识实习（北戴河） Primary Field Training | 3 | 2 周 | | | | 3 | | | | | | |
| | 40102902 | 地质教学实习（周口店）B Geological Field Training B | 6 | 4 周 | | | | | | 6 | | | | |
| | 40410700 | 专业教学实习（三峡） Professional Teaching Practice | 6 | 4 周 | | | | | | | | 6 | | |
| | 40410800 | 专业课程设计 Professional Course Project Design | 1.5 | 1 周 | | | | | | | | 1.5 | | |

| 课程类别 Classi-fication | 课程编号 Code | 课程名称 Course Name | 学分 Crs | 学时 Hrs | 学时分类 Class Hours | | 学期学分分配 Semester Credits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 讲课 Lec. | 实验 Lab. | 一 1st | 二 2nd | 三 3rd | 四 4th | 五 5th | 六 6th | 七 7th | 八 8th |
| | 40400400 | 毕业实习 Practice for Graduation | 12 | 8 周 | | | | | | | | | | 12 |
| | 40400300 | 毕业设计 Design for Graduation | 12 | 8 周 | | | | | | | | | | 12 |
| | **小计 Sum** | | **47** | **32.5 周** | | | **4.5** | **5** | | **6** | | **7.5** | | **24** |
| **自主学习 Autonomous Learning** | ZZ35S | 社会调查 Social Investigation | 2 | | | | | | | | | | | |
| | ZZ09Y | 大学英语(自主学习) College English(Autonomous Learning) | 3 | | | | | | | | | | | |
| | | 其他(学科竞赛、发明创造、科研报告) Others (Contest, Invention, Innovation and Research Presentation) | 3 | | | | | | | | | | | |
| | **小计 Sum** | | **8** | | | | | | | | | | | |
| **总计 Total** | | | **212.5** | **2520+32.5 周** | **1994** | **230** | **23** | **32.5** | **23.5** | **32.5** | **17** | **28** | **12** | **24** |
| **专业选修课列表 Specialty Elective Courses** | 20508400 | 工程地质学 Principles of Engineering Geology | 2.5 | 40 | 40 | | | | | | 2.5 | | | |
| | 20517100 | 岩体力学 Rock Mechanics | 2.5 | 40 | 32 | 8 | | | | | | 2.5 | | |
| | 20506100 | 地质灾害防治工程 Control Engineering for Geo-disasters | 2.5 | 40 | 40 | | | | | | | | 2.5 | |
| | 20413900 | 环境地质学 A Environmental Geology A | 2.5 | 40 | 40 | | | | | | | | 2.5 | |
| | 20517200 | 岩土测试技术 Rock and Soil Testing Techniques | 2 | 32 | 24 | 8 | | | | | | 2 | | |
| | 20509500 | 工程招标投标与概预算 Engineering Budget and Bidding | 2.0 | 32 | 32 | | | | | | | | 2 | |
| | 20410400 | 水资源法规导论 Introduction to Water Resource Regulation | 2 | 32 | 32 | | | | | | | | 2 | |
| | 20414700 | 包气带水文地质学 Vadose Zone Hydrogeology | 1.5 | 24 | | | | | | | | 1.5 | | |
| | 20405700 | 环境同位素原理与技术 Environment Isotope Principles | 2 | 32 | 32 | | | | | | | | 2 | |
| | 20414500 | 地下水污染与防治 Groundwater Contamination & Prevention | 3 | 48 | 28 | 20 | | | | | | | 3 | |
| | 20413600 | 土壤污染与防治 Soil Pollution and Remediation | 2.5 | 40 | 28 | 12 | | | | | 2.5 | | | |
| | 21704500 | 环境法规 Environmental Law | 1.5 | 24 | 24 | | | | | | | | 1.5 | |

| 课程类别 Classi-fication | 课程编号 Code | 课程名称 Course Name | 学分 Crs | 学时 Hrs | 学时分类 Class Hours | | 学期学分分配 Semester Credits | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 讲课 Lec. | 实验 Lab. | 一 1st | 二 2nd | 三 3rd | 四 4th | 五 5th | 六 6th | 七 7th | 八 8th |
| | 20413800 | 水污染控制工程 Water Pollution Control Engineering | 3 | 48 | 36 | 12 | | | | | 3 | | | |
| | 20510002 | 固体废物处理与处置 B Solid Waste Treatment and Disposal B | 2 | 32 | 32 | | | | | | 2 | | | |
| | 20405302 | 环境评价 B Environmental Assessment B | 3 | 48 | 32 | 16 | | | | | | 3 | | |
| | 20404901 | 环境监测 A Environmental Monitoring A | 4 | 64 | 32 | 32 | | | | | | 4 | | |

注：通识教育选修课和自主学习学分未纳入具体学期。

## 水文与水资源工程专业课程分类统计

| | 通识教育课程 Liberal Education Courses | | 学科基础课 Disciplinary Fundamental Courses | 专业主干课 Main Specialty Courses | 专业选修课 Specialty Elective Courses | 实践环节 Practical Work | 自主学习 Autonomous Learning | 学时总计 Total Hours | 学分总计 Total Credits |
|---|---|---|---|---|---|---|---|---|---|
| | 必修 | 选修 | | | | | | | |
| 学时/学分 | 584/36.5 | 192/12 | 928/58 | 560/35 | 256/16 | 32.5 周/47 | 8 | 2520+32.5 周 | 212.5 |
| 学分所占比例 | 22.8% | | 27.3% | 16.5% | 7.5% | 22.1% | 3.8% | | 100% |