

水资源与环境工程实验班培养方案

专业名称与代码：水资源与环境工程实验班 0801（0814）

专业培养目标：培养以地球系统科学理论为基础的，具有地学特色的，兼备水资源、环境科学与工程专业知识的，品德高尚、崇尚科学的复合学术型拔尖人才。

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，主要学习地下水资源开发、利用、保护与管理方面基本理论和基本方法，培养野外水文地质调查、测绘、制图、实验、测试及数据处理等方面基本技能，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、具有浓厚的爱国情结和民族自尊心、自豪感；
- 2、热爱科学，具有为科学事业献身的精神；
- 3、具有求“科学之真、人文之善、艺术之美”的高尚品质；
- 4、具有强的团队协作精神和组织管理能力；
- 5、具有宽厚的数学、物理、化学和生物学基础知识；
- 6、具有扎实的地质学基础；
- 7、具有地球系统科学理念；
- 8、具备系统的水文地质、工程地质、环境地质等专业知识；
- 9、具备过硬的外语、计算机、文字表达能力和野外调查、室内实验、仪器分析及数据处理分析技能。

主干学科：地质工程、水利工程、环境科学与工程。

核心课程：主要属于工程类，课程设置体现水资源与环境工程领域宽厚的理论基础和严格的科研基本功训练。主干课程设有地质学基础、水文地质学基础、地下水动力学、水文地球化学、环境微生物学、环境工程设计原理、环境地质、地下水污染与防治、水资源开发与保护、生态学等；并设置了不同方向的专业选修课、专题讲座、公共选修课以及科研训练等。

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、水分析化学实验等。

主要实践性教学环节：计算机程序课程设计、工程测量实习、地质基础实习、专业基础教学实习，专业教学实习、毕业实习与毕业设计等。

修业年限：四年。

授予学位：工学学士。

相近专业：环境工程，水文与水资源工程、地下水科学与工程、地质工程。

Program For Water Resources and Environmental Engineering

Experimental Class

Specialty and Code: Water Resources and Environmental Engineering, 0801 (0814)

Education Objective: The subject aims at cultivating composite academic talent with noble nature and advocating science, focusing on knowledge of geosciences with composite background in water resources and environmental science and engineering.

Education Requirements: Based on mastery of 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. They should have the ability to solve practical engineering problems, engaged in scientific research, organizing and managing.

Graduates Are Required:

1. To have strong patriotism and the national pride.
2. To have spirit of devotion for science.
3. To have noble quality of Truth of science, Benevolence of moral, Beauty of art.
4. To have strong team work spirit and organizational management ability.
5. To have generous knowledge of mathematics, physics, chemistry and biology, etc.
6. To have solid basic knowledge of geology.
7. To have geosciences Mind.
8. To have comprehensive professional knowledge of Hydrogeology, Engineering Geology and Environmental Geology.
9. To be proficient in computer data manipulation, comprehensive in computer programming techniques using at least one calculating language, and skillful in dealing with graphics, data, and words for research and application.

Major Disciplines: Geological Engineering, Hydraulic Engineering, Environmental Sciences and Engineering.

Main Courses: Fundamentals of Geology, Hydrogeology, Groundwater Hydrodynamics, Hydrogeochemistry, Environmental Microbiology, Environmental Engineering Design Principles, Environmental Geology, Groundwater Contamination, Water Resources Exploitation and Protection, Ecology; in Addition, Many Optional Courses, Special Lectures, and Scientific Training Different Environmental Aspects Could Be Chosed.

Lab Experiments: Hydraulic, Hydrodynamics, Hydrochemistry, Water Analysis, etc.

Practical Work: Instructive Practice for Technical Drawing, Cognitive Geological Field Practice, Field Induction in Geology, Course Project Design for Computer Programming, Course Project Design for Mathematical Modeling, Graduation Practice and Design, etc.

Duration: Four years.

Degree Granted: Bachelor of Science.

Related Specialties: Environmental Engineering, Hydrological and Water Resources Engineering, Groundwater Sciences and Engineering.

水资源与环境工程实验班课程教学计划表

Course Descriptions of Water Resources and Environmental Engineering Experiment Class

课程类别 Classification	课程编号 Code	课程名称 Course Name	学分 Crs	学时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits										
					讲课 Lec.	实验 Lab.	一	二	三	四	五	六	七	八			
							1st	2nd	3rd	4th	5th	6th	7th	8th			
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									
	11914800	Visual C++程序设计 Programming in Visual C++ Language	2	32	20	12			2								
	20412700	环境科学导论 Introduction to Environmental Sciences	2.5	40	40		2.5										
	14300100	军事理论 Military Theory	2	32	32		2										
	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		52	832	804	28	10	12	11	7							

课程类别 Classification	课程编号 Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits											
					讲课 Lec.	实验 Lab.	一	二	三	四	五	六	七	八				
							1st	2nd	3rd	4th	5th	6th	7th	8th				
学科基础课 Disciplinary Fundamental Courses	212028*2	高等数学 B Advanced Mathematics B	12.5	200	186	14	4.5	6.5										
	21208803	线性代数 C Linear Algebra C	2.5	40	40				2.5									
	21209602	概率论与数理统计 B Probability and Mathematics Statistics B	3	48	48						3							
	21206300	数学实验 Mathematics Experiments	1	16		16		1										
	212093*0	大学物理 C College Physics C	7	112	112			3.5	3.5									
	212092*2	物理实验 B Physics Experiments B	3.5	56		56		2	1.5									
	20302403	大学化学 C College Chemistry C	4	64	50	14			4									
	20311402	有机化学 B Organic Chemistry B	3.5	56	40	16				3.5								
	20311502	分析化学 B Analytical Chemistry B	3	48	32	16					3							
	20414000	生物化学 Biochemistry	4.5	72					4.5									
	20105300	普通地质学 Physical Geology	3	48	48			3.0										
	20105200	矿物岩石学 Mineralogy and Lithology	2.5	40	40				2.5									
	20104002	构造地质学 B Structure Geology B	3	48	48					3								
	20101600	地貌学及第四纪地质学 Geomorphology and Quaternary Geology	2.5	40	40								2.5					
	21114302	测量学 B Surveying B	2.5	40	40		2.5											
	20508002	工程力学 B Engineering Mechanic B	5	80	72	8				5								
	20408400	水力学 Hydraulics	2.5	40	32	8				2.5								
		小计 Sum		65.5	1048	828	148	7	16	18.5	17	3	2.5					
专业主干课 Main Specialty Courses	20409101	水文地质学基础 A The Principles of Hydrogeology A	4	64	40	24					4							
	20400801	地下水动力学 A Groundwater Hydraulics A	4	64	40	24					4							
	20408800	水文地球化学/附水分析 Hydro-Geochemistry	3	48	36	12						3						
	20404200	环境工程微生物及实验 Environmental Microbiology	3	48	28	20					3							
	20403800	环境工程设计原理 Environmental Engineering Design	2.5	40	40						2.5							
	20413900	环境地质学 A Environmental Geology A	2.5	40	40									2.5				
	20414500	地下水污染与防治 Groundwater Contamination and Prevention	3	48	28	20										3		
	20407400	生态学 General Ecology	2	32	32								2					

课程类别 Classification	课程编号 Code	课程名称 Course Name	学分 CrS	学时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits							
					讲课 Lec.	实验 Lab.	一	二	三	四	五	六	七	八
							1st	2nd	3rd	4th	5th	6th	7th	8th
	20414200	水资源开发与保护 Water Resources Exploitation	1.5	24	24							1.5		
	小计 Sum		25.5	408	308	100						13.5	6.5	5.5
专业选修课 Specialty Elective Courses		具体见专业选修课列表	15	240								5	8	2
合计 Sub-total			158	2528	1942	266	17	28	29.5	24	16.5	14	13.5	2
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 B Surveying Practice B	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	水资源与环境专业课程设计 Professional Course Project Design	1.5	1周							1.5			
	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	1.5	6	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			213	2528+32.5周	1942	266	21.5	33	29.5	30	18	20	13.5	26

水文与水资源工程方向选修课程

Elective Courses for Hydrology & Water Resources Engineering Major

课程类别 Classification	课程编号 Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits											
					讲课 Lec.	实验 Lab.	一	二	三	四	五	六	七	八				
							1st	2nd	3rd	4th	5th	6th	7th	8th				
专业选修课列表 Specialty Elective Courses	前沿类 至少1门 Choose 1 course Frontier	20411600	学科研究前沿 Research Progress in Hydrogeology & Environmental Engineering	2	32	32											2	
		20413700	地球科学与环境 Earth Science and Environment	2.5	40	40							2.5					
	专业类 至少3门 At least choose 3 courses Professional	20515800	土力学 Soil Mechanics	3	48	48						3						
		20517100	岩体力学 Rock Mechanics	2.5	40	32	8						2.5					
		20508400	工程地质学 Principles of Engineering Geology	2.5	40	40						2.5						
		20414300	工程水文地质学 Engineering Hydrogeology	2.5	40	40							2.5					
		20506100	地质灾害防治工程 Control Engineering for Geo-disasters	2.5	40	40									2.5			
		20405002	环境监测 B Environmental Monitoring B	3	48	28	20							3				
		20405303	环境评价 C Environmental Assessment C	2	32	32								2				
		20413600	土壤污染与防治 Soil Pollution and Remediation	2.5	40	28	12						2.5					
		方法与技术类 至少3门 At least choose 3 courses Method & Technology	20714600	建筑制图 Architecture Drawing	3.5	56	44	12						3.5				
			20714702	电工与电子技术 B Electrician & Technetronic B	5	80	68	12							5			
	20401000		地下水防治技术与方法 Groundwater Control Techniques	1.5	24	24										1.5		
	20414400		水文地质工程地质勘察方法 Investigation of Hydrogeology and Engineering Geology	2.5	40	40								2.5				
	20409600		水文学原理与水文测验 The Principles of Hydrology & Gauging	2.5	40	34	6				2.5							
	20401400		地下水数值模拟基础及应用 Groundwater Modeling	2	32	20	12									2		
	20405700		环境同位素原理与技术 Environment Isotope Principles	2	32	26	6									2		
	20603500		工程物探 Eng-Geophysical Prospecting	2	32	24	8								2			
	21100700		GIS 原理与应用 Principles & Applications of GIS (Bilingual Teaching)	2.5	40	30	10										2.5	

环境工程方向选修课程
Elective Courses for Environmental Engineering Major

课程类别 Classification	课程编号 Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits											
					讲课 Lec.	实验 Lab.	一	二	三	四	五	六	七	八				
							1st	2nd	3rd	4th	5th	6th	7th	8th				
专业选修课列表 Specialty Elective Courses	前沿类 至少1门 At least Choose 1 course	20411600	学科研究前沿 Research Progress in Hydrogeology & Environmental Engineering	2	32	32											2	
		20413700	地球科学与环境 Earth Science and Environ- ment	2.5	40	40							2.5					
	专业类 至少3门 At least choose 3 courses	20413800	水污染控制工程 Water Pollution Control Engineering	3	48	36	12						3					
		20414100	大气污染控制 Atmospheric Pollution Control	2	32	32						2						
		20405002	环境监测 B Environmental Monitoring B	3	48	28	20							3				
		20405303	环境评价 C Environmental Assessment C	2	32	32								2				
		20413600	土壤污染与防治 Soil Pollution and Remediat- ion	2.5	40	28	12						2.5					
		20510002	固体废物处理与处置 B Solid Waste Disposal B	2	32	32								2				
		20515800	土力学 Soil Mechanics	3	48	48							3					
		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
		方法与技术类 至少3门 At least choose 3 courses	20714600	建筑制图 Architecture Drawing	3.5	56	44	12						3.5				
	20714702		电工与电子技术 B Electrician & Technetronic B	5	80	68	12							5				
	20401000		地下水防治技术与方法 Groundwater Control Techniques	1.5	24	24												1.5
	20414400		水文地质工程地质勘察方 法 Investigation of Hydrogeology and Engineering Geology	2.5	40	40									2.5			
20409600	水文学原理与水文测验 The Principles of Hydrology & Gauging		2.5	40	34	6					2.5							

课程 类别 Classi- fication	课程 编号 Code	课程名称 Course Name	学 分 Crs	学 时 Hrs	学时分类 Class Hours		学期学分分配 Semester Credits									
					讲 课 Lec.	实 验 Lab.	一	二	三	四	五	六	七	八		
							1st	2nd	3rd	4th	5th	6th	7th	8th		
	20401400	地下水数值模拟基础及应用 Groundwater Modeling	2	32	20	12									2	
	20405700	环境同位素原理与技术 Environment Isotope Principles	2	32	26	6									2	
	20603500	工程物探 Eng-Geophysical Prospecting	2	32	24	8								2		
	21100700	GIS原理与应用 Principles & Applications of GIS	2.5	40	30	10									2.5	

注：通识教育选修课和自主学习学分未纳入具体学期。

水资源与环境工程实验班课程分类统计

	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	640/40	192/12	1048/65.5	400/25.5	248/15	32.5 周/47	8	2528+ 32.5 周	213
学分所 占比例	24.4%		30.8%	12%	7%	22%	3.8%		100%