

环境工程(菁英班)专业培养方案

专业名称与代码:环境工程 082502

专业培养目标:本专业培养具备良好的公民素质与修养、具有科学思维与科学辨识能力的科学公民;掌握基本科学研究能力,并具有以地学为基础、水体与生态修复为特色的环境工程理论与技术能力,能在地质环境保护与治理、环境监测、环境评价、环境规划与管理、环境污染防治等领域从事设计、实施、管理等方面工作的专业工程技术与管理人才。

专业毕业要求

1. 掌握环境工程原理、水污染控制工程、固体废物处理与处置、环境监测等基础理论、基本知识、技能和工作方法,熟悉水体与生态修复工作和研究知识。
2. 掌握地质学基础、地下水科学理论、环境地质与工程等基础理论知识和基本技能与方法。
3. 具备从事水污染控制工程、固体废物处理与处置、环境影响评价、规划等实际工作能力。
4. 具备从事地质环境调查、评价、监测的实际工作能力。
5. 熟悉国家有关水环境方面的方针、政策和法规,具有一定的管理知识和能力。
6. 掌握资料查询以及获取信息的基本方法,具有资料归纳、整理和综合分析并加以正确表达的能力。

毕业要求及实现途径

序号	毕业要求	实现途径(教学过程)
1	掌握环境工程原理、水污染控制工程、固体废物处理与处置、环境监测等基础理论、基本知识、技能和工作方法,熟悉水体与生态修复工作和研究知识	①课堂教学:无机化学、分析化学、有机化学、水力学、环境微生物学、工程制图、环境工程原理、水污染控制工程、大气污染控制、水力学实验、水污染控制工程实验、固体废物处理与处置、环境监测、水体生态修复技术、非点源污染控制 ②课外学习:污染控制专业课程设计、毕业实习、毕业设计
2	掌握地质学基础、地下水科学理论、环境地质与工程等基础理论知识和基本技能与方法	①课堂教学:水文地质学基础、工程地质学基础、地下水动力学、水文地球化学、地下水污染与防治、环境地质学、普通地质学、水文地质学基础实验、地下水污染与防治实验 ②课外学习:地质学基础实习、毕业实习、毕业设计、地球环境生态认识实习
3	具备从事水污染控制工程、固体废物处理与处置、环境影响评价、规划等实际工作能力	①课堂教学:环境监测、环境评价、环境规划与管理、固体废物处理与处置、水污染控制工程、水污染控制工程实验 ②课外学习:毕业实习、毕业设计
4	具备从事地质环境调查、评价、监测的实际工作能力	①课堂教学:环境监测、环境评价 ②课外学习:综合专业教学实习、毕业实习、毕业设计
5	熟悉国家有关水环境方面的方针、政策和法规;具有一定的管理知识和能力	①课堂教学:环境监测、环境评价、环境规划与管理、环境监测实验 ②课外学习:毕业实习、毕业设计
6	掌握资料查询以及获取信息的基本方法,具有资料归纳、整理和综合分析并加以正确表达的能力	①课堂教学:环境监测、环境评价、环境规划与管理 ②课外学习:毕业实习、毕业设计

主干学科:环境科学与工程、地下水科学与工程。

核心课程:环境微生物学、环境工程原理、水污染控制工程、环境监测、环境评价、环境规划与管理、水文地质学基础、地下水动力学、地下水污染与防治、环境地质学、非点源污染控制、污染水体生态修复技术。

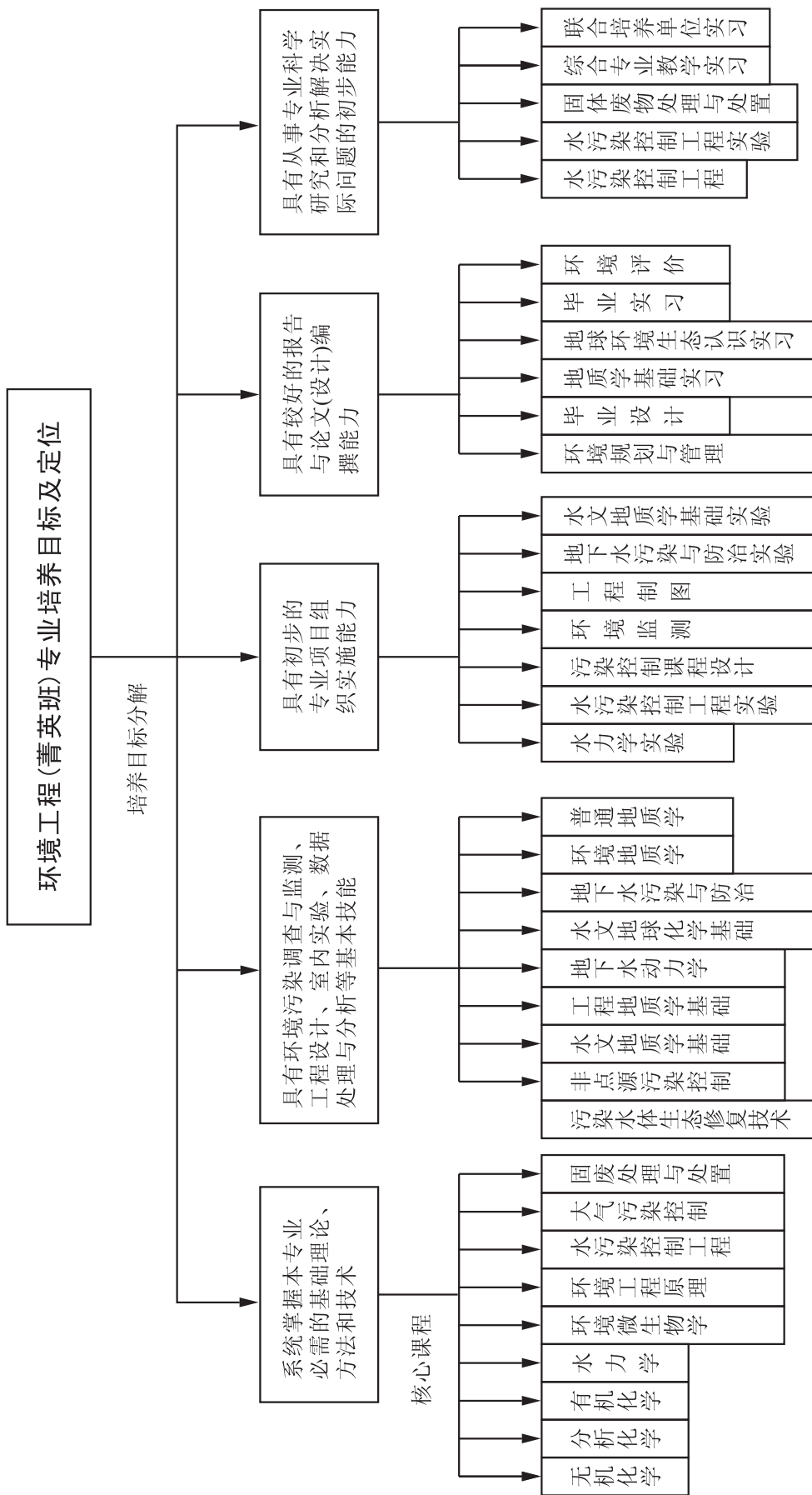
主要专业实验:水力学实验、水污染控制工程实验、环境监测实验、水文地质学基础实验、地下水污染与防治实验。

主要实践性教学环节:地球环境生态认识实习、地质学基础实习、污染控制专业课程设计、综合专业教学实习、毕业实习、毕业设计等,联合培养单位实习。

修业年限:四年。

授予学位:工学学士。

相近专业:环境科学、生态学、地下水科学与工程。



Program for Environmental Engineering (Elite Class)

Specialty and Code: Environmental Engineering 082502

Education Objective: The program aims at cultivating engineers and specialists with the knowledge of earth science, environmental science and engineering. The graduates will master the basic and specialized knowledge for environmental protection, contamination control, environmental management and environmental monitoring, and engage in the occupational areas of environmental (especially geo-environmental) evaluation, environmental programming design, management and scientific research.

Graduation Requirements

1. Master the basic theories, skills and knowledge of design principles of environmental engineering, water pollution control, solid waste disposal and treatment, water body ecological remediation, and environmental monitoring.
2. Master basic theories, skills and knowledge of earth science, groundwater, environmental geology and engineering.
3. Have basic ability on water pollution control, solid waste disposal and treatment, environmental assessment and planning.
4. Master skills in geological environments investigation, evaluation and monitoring.
5. Be familiar with policies and regulations pertaining to the aquatic environment, and being equipped with management knowledge and ability.
6. To master the basic methods of literature search and information collection, possess the essential ability of understanding, organizing, analyzing interpreting and processing of information.

Graduation Requirements and Ways to Achieve

No.	Graduation Requirements	Ways to Achieve(Teaching Process)
1	Master the basic theories, skills and knowledge of design principles of environmental engineering, water pollution control, solid waste disposal and treatment, water body ecological remediation, and environmental monitoring	<p>① Classroom Teaching: Inorganic Chemistry, Analytical Chemistry, Organic Chemistry, Hydraulics, Environmental Microbiology, Technical Drawing, Principles of Environmental Engineering, Water Pollution Control Engineering, Solid Waste Disposal and Treatment, Atmospheric Pollution Control, Environmental Monitoring, Hydraulic Testing, Water Pollution Control Engineering Testing, Water Body Ecological Remediation, Non-point Source Pollution Control</p> <p>② Out-of-class Learning: Graduation Practice, Graduation Design, Specialized Design for Water Pollution Control Engineering</p>

No.	Graduation Requirements	Ways to Achieve(Teaching Process)
2	Master basic theories, skills and knowledge of earth science, groundwater, environmental geology and engineering	① Classroom Teaching: Physical Geology, Fundamental Hydro-geology, Engineering Geology, Dynamics of Groundwater, Hydro-geochemistry, Groundwater Pollution and Prevention, Environmental Geology, Fundamental Hydrogeology Testing, Groundwater Pollution and Prevention Testing ② Out-of-class Learning: Primary Field in Terrestrial Environments, Geological Practice, Graduation Practice, Graduation Design
3	Have basic ability on water pollution control, solid waste disposal and treatment, environmental assessment and planning	① Classroom Teaching: Water Pollution Control Engineering, Solid Waste Disposal and Treatment, Environmental Monitoring, Environmental Assessment, Environmental Planning and Management, Water Pollution Control Engineering Testing ② Out-of-class Learning: Graduation Practice, Graduation Design
4	Master skills in geological environments investigation, evaluation and monitoring	① Classroom Teaching: Environmental Monitoring, Environmental Assessment ② Out-of-class Learning: Comprehensive Professional Teaching Practice, Graduation Practice, Graduation Design
5	Be familiar with policies and regulations pertaining to the aquatic environment, and being equipped with management knowledge and ability	① Classroom Teaching: Environmental Monitoring, Environmental Assessment, Environmental Planning and Management, Environmental Monitoring Assessment ② Out-of-class Learning: Graduation Practice, Graduation Design
6	To master the basic methods of literature search and information-collection, possess the essential ability of understanding, organizing, analyzing interpreting and processing of information	① Classroom Teaching: Environmental Monitoring, Environmental Assessment, Environmental Planning and Management ② Out-of-class Learning: Graduation Practice, Graduation Design

Major Disciplines: Environmental Science and Engineering, Groundwater Science and Engineering.

Main Courses: Environmental Microbiology Principles of Environmental Engineering, Water Pollution Control Engineering, Environmental Monitoring, Environmental Assessment, Environmental

Planning and Management, Fundamental of Hydrogeology, Groundwater Hydraulics, Groundwater Pollution and Prevention, Environmental Geology, Non-point Source Pollution Control, Bio-remediation Technique on Polluted Water.

Lab Experiments: Hydraulic Testing, Water Pollution Control Engineering Testing, Environmental Monitoring Testing, Fundamental Hydrogeology Testing, Groundwater Pollution and Prevention Testing.

Practical Work: Cognitive Practice in Terrestrial Environments, Practice for Geology, Specialized Design for Water Pollution Control Engineering, Comprehensive Professional Teaching Practice, Graduation Practice and Design, Practice in Joint Institutes.

Duration: four years.

Degree Granted: Bachelor of Engineering.

Related Specialties: Environmental Science, Ecology, Groundwater Science and Engineering.

环境工程(菁英班)课程教学计划表
Course Descriptions of Environmental Engineering(Elite Class)

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite Courses	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 Introduction to Mao Tse-tung Thought and 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 Fun- damentals of Law	3	48	48				1.5	1.5									
		113076 * 0	体育 Physical Education	4	144	144				1	1	1	1							
		109116 * 0	大学英语 College English	12	192	192				3	3	3	3							
		11918901	C 语言程序设计 A C Language Programming A	3.5	56	40	16				3.5									
		20413200	环境科学与工程导论 Introduction to Environmen- tal Sciences and Engineering	1	16	16				1										
		14300100	军事理论 Military Theory	2	32	32				2										
		选修 Elective	总计 12 学分,含创新创业选修课学分,跨 学科选修课不低于 6 学分。“形势与政 策”课程作为限选课,由马克思主义学院 实施		12	192														
		小计 Sum		46.5	824	616	16		11.5	9	8	6	0	0	0	0	0	0		
学科基础课 Disciplinary Fundamental Courses	212127 * 2	高等数学 B Advanced Mathematics B	10	160	160				4	6										
	212130 * 2	大学物理 B College Physics B	7	112	112					3.5	3.5									
	21213202	物理实验 B Physical Experiment B	2	32		32			2											
	21212802	线性代数 B Linear Algebra B	2.5	40	40						2.5									

课程类别 Course Classifi- cation	课程编号 Course Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite Courses	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		
					Disciplinary Fundamental Courses 学科基础课												
	21213502	概率论与数理统计 B Probability and Mathematics Statistics B	2.5	40	40					2.5							
	21120802	测量学 B Surveying B	2	32	32			2									
	20114900	普通地质学 Physical Geology	3	48	40	8			3								
	20113100	矿物岩石学 A Mineralogy and Lithology A	3	48	48					3							
	20104002	构造地质学 B Structural Geology B	3	48	36	12				3							
	20115100	地貌学及第四纪地质学 Geomorphology and Quater- nary Geology	2.5	40	40						2.5						
	20408400	水力学 Hydraulics	2.5	40	32	8					2.5						
	20302403	大学化学 C College Chemistry C	4	64	50	14			4								
	20311502	分析化学 B Analytical Chemistry B	3	48	28	20				3							
	20311402	有机化学 B Organic Chemistry B	3.5	56	40	16					3.5						
	20309202	物理化学 B Physical Chemistry B	3	48	48						3						
	20714600	建筑制图 Architecture Drawing	3.5	56	48	8							3.5				
	小计 Sum		57	912	794	118			10	17.5	17.5	8.5	3.5	0	0	0	
Main Specialty Courses 专业主干课																	
	20409101	水文地质学基础 A Fundamental of Hydrogeolo- gy 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 Hydro-geochemistry	3	48	36	12								3			
	20414500	地下水污染与防治 Groundwater Pollution and Prevention	3	48	28	20									3		
	20403400	环境地质学 B Environmental Geology B	2	32	32										2		
	20404200	环境工程微生物及实验 Environmental Microbiology	3	48	28	20						3					

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite Courses	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										
					Main Specialty Courses 专业主干课											20403800	环境工程设计原理 Principle of Environmental Engineering	2.5	40	40					2.5
20407400	生态学 Ecology	2	32	32																		2			
20414100	大气污染控制 Atmospheric Pollution Control	2	32	32																	2				
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				
20405303	环境评价 C Environmental Assessment C	2	32	32																		2			
20405103	环境监测 C Environmental Monitoring C	2	32	32																	2				
20404400	环境规划与管理 Environmental Planning and Management	2	32	32																		2			
20413600	土壤污染和防治 Soil Pollution and Remediation	2.5	40	28												12							2.5		
20423300	非点源污染控制 Non-point Source Pollution Control	1.5	24	16												8							1.5		
20422900	污染水体生态修复技术 Bio-remediation Technique on Polluted Water	2	32	32																			2		
	小计 Sum		42.5	680												548	132				0	0	3	6.5	16
Specialty Elective Courses 专业选修课		具体见专业选修课列表	6	96																					
合计 Sub-total			152	2512	1958	266			21.5	26.5	28.5	21	19.5	17	0	0									
Practical Work 实践环节	44300200	军事训练 Military Training	2	2周					2																
	41919001	C语言课程设计 A Course Design for C Language A	1.5	1.5周						1.5															

课程类别 Course Classifi- cation	课程编号 Course Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite Courses	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				
实践环节 Practical Work	41120902	测量教学实习 B Surveying Practice B	0.5	0.5 周				0.5											
	40115200	地质认识实习(北戴河) Primary Field Training(Beid- aihe)	2	2周					2										
	40115602	地质教学实习(周口店)B Geological Field Training (Zhoukoudian) B	4	4周							4								
	40421402	专业教学实习(三峡)B Professional Teaching Prac- tice(The Three Gorges) B	4	4周										4					
	40422300	水污染控制课程设计 Course Design for Water Pol- lution Control Engineering	2	2周									2						
	40422400	环境监测课程设计 A Course Design for Environ- mental Monitoring A	2	2周									2						
	40422500	环境评价课程设计 A Course Design for Environ- mental Assessment A	1	1周										1					
	40422600	联合培养单位实习 Practice in Joint Institutes	4	4周													4		
	40422700	毕业实习 Practice for Graduation	4	4周														4	
	40422800	毕业设计 Thesis Writing for Gradua- tion	10	10周															10
		小计 Sum		37	37周					2.5	3.5	0	4	4	5	4	4	14	
创新创业自主学习 Autonomous Learning	ZZ35000S	社会调查 Social Investigation	2																
		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	5																
总计 Total			194	2512 + 37周	1958	266			24	30	28.5	25	23.5	22	4	14			

课程类别 Course Classification	课程编号 Course Code	课程名称 Course Name	学分 Crts	学时 Hrs	学时分类 Class Hours		先修课程 Prerequisite Courses	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	
可开出专业选修课列表 Specialty Elective Courses	21100700	GIS原理与应用 Principles and Applications of GIS	2.5	40	30	10								2.5		
	20508400	工程地质学基础 B Engineering Geology B	2.5	40	40							2.5				
	20423000	地表水文学 Surface Hydrology	2	32	32							2				
	20423100	湖泊生态系统演化 Ecosystem Evolution of Lake	2	32	32								2			
	20423200	水环境工程技术 Environmental Engineering for Water Body	2	32	32							2				
	20509500	工程招标投标与概预算 Engineering Budget and Bidding	2	32	32									2		
	20404000	环境工程施工技术 Environmental Engineering Construction Techniques	2	32	32									2		
	20407100	清洁生产工艺 Clean Manufacturing Techniques	1.5	24	24									1.5		
	20402900	环保设备基础 Environmental Protection Equipment	1	16	16									1		
	21704500	环境法规 Environmental Law	1.5	24	24								1.5			
	20411800	噪声控制 Noise Pollution Control	1	16	16									1		
	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			
	20405700	环境同位素原理与技术 Principles and Technology of Environment Isotope	2	32	32								2			
	20508200	工程地质勘察 Geological Engineering Investigation	2.5	40	40									2.5		
	20506100	地质灾害防治工程 Control Engineering for Geodisasters	2.5	40	40									2.5		

注：通识教育选修课学分和创新创业自主学习学分未列入具体学期。

环境工程(菁英班)专业课程分类统计

Course Category Statistics of Environmental Engineering(Elite Class)

课程学分 统计	通识教育课 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	创新创业 自主学习 Autonomous Learning	学时总计 Total Hours	学分总计 Total Credits
	必修 Compulsory	选修 Selective							
学时/学分 Hrs/Crs	632/34.5	196/12	912/57	680/42.5	96/6	37周/37	5	2512 +37周	194
学分所占比例 Proportion of Credits	23.9%		29.4%	21.9%	3.1%	19.1%	2.6%		100%