

Environmental Engineering

(Grade 2022)

Course code: 082502

I. Cultivation Objectives

1. General cultivation objective

This program cultivates innovative, technically proficient, responsible and internationalized application-oriented talents who are capable of working in the fields of emission control and ecological remediation, municipal solid waste treatment and disposal, especially e-waste resource recovery, etc., with good professional ethics and strong practical engineering skills and a comprehensive development of moral, intellectual, physical, aesthetic and labour skills.

2. Objective of value guidance

This program takes moral education as its foundation and integrates core values of socialism into the full process of education, in order to guide students to pay attention to the concept and practice of green development in the new era, establish consciousnesses of ecological civilization, enhance the "ideological perspective", "practical perspective", "systemic perspective" and "global perspective" of environmental protection in China, actively cultivate the love of the Party and patriotism among environmental engineering students, and strengthen the value base of students.

3. Five years after graduation, students in this program should achieve the following objectives:

- (1) Be able to apply mathematics, natural sciences, engineering fundamentals and professional knowledge to analyse and solve complex Environmental Engineering problems, and be competent in environmental planning, engineering design, operation and maintenance, technology research and development, management consultancy, analysis and monitoring in relation to Environmental Engineering.
- (2) Have good humanities and scientific literacy, social responsibility and professional ethics, and the ability to consciously and effectively integrate social, health, safety, legal, cultural and sustainable development factors into solutions to complex engineering problems.
- (3) Have the ability to communicate and express themselves effectively, to work in a team, and to organize and carry out project implementation.
- (4) Possess a certain engineering innovation ability, global consciousnesses and international perspective, and have the consciousnesses and ability of independent and lifelong learning.

II. Graduation requirements

According to the 12 basic requirements of the General Standard of China Engineering Education Accreditation Association (CEEAA), the graduation requirements of this program have been formulated in conjunction with the training objectives of the program, and the indicators of each graduation requirement are listed as follows:

1. engineering knowledge: Have the ability to apply mathematics, natural sciences, engineering fundamentals and professional knowledge to complex Environmental Engineering problems.
2. Analysis of the Problem: Have the ability to apply the fundamental principles of mathematics, natural and engineering sciences to identify, represent, and analyse complex Environmental Engineering problems through

literature research in order to reach valid conclusions.

3. Design/develop of solutions: Be able to design solutions to complex Environmental Engineering problems, designing systems, units (components) or processes to meet specific needs, and be able to demonstrate a sense of innovation in the design process, taking into account social, health, safety, legal, cultural and environmental factors.

4. Research: Have the ability to apply scientific principles and methods to complex Environmental Engineering problems, including designing experiments, analyzing and interpreting data, and synthesizing information to reach valid conclusions.

5. Use of modern tools: Have the ability to develop, select and use appropriate techniques, resources, modern engineering tools and information technology tools for complex Environmental Engineering problems, including prediction and modelling of complex Environmental Engineering problems, and to understand their limitations.

6. Engineering and Society: Be able to undertake sound analysis based on background knowledge of Environmental Engineering and evaluate the social, health, safety, legal and cultural impacts of professional engineering practice and solutions to complex Environmental Engineering problems, and understand the responsibilities involved.

7. Environment and Sustainable Development: Have the ability to understand and evaluate the environmental and social sustainability impacts of engineering practices that address complex Environmental Engineering issues.

8. Professional Codes: Have good humanities and social sciences literacy, social responsibility and the ability to understand and comply with engineering ethics and codes of practice and responsibilities in the practice of engineering.

9. Individual and team: Have the ability to assume the role of individual, team member and leader of a team in a multidisciplinary context.

10. Communication: Have the ability to communicate effectively with industry peers and the public on complex Environmental Engineering issues, including writing reports, briefs design, presenting statements, articulating or responding to instructions, and having an international perspective and the ability to communicate and interact in a cross-cultural context.

11. Project Management: Understand and master the principles of engineering management and economic decision-making methods, and apply them in a multidisciplinary environment.

12. Spirit and ability of lifelong learning: Have a sense of independent and lifelong learning, with the ability to learn and adapt to development.

III. Schooling System

Four years.

IV. Length of Study

Flexible study period, generally four years, the minimum length of flexibility is not less than three years, the longest not more than six years.

V. Requirements for Graduation and Degree Conferring

In order to graduate, students must complete the minimum number of credits required by the Instructive

Cultivation Plan for each course category and all the content required by the Extracurricular Class, with a total of 165 credits, and will be awarded a Bachelor of Engineering degree if they meet the requirements for the award of a Bachelor's degree.

VI. Discipline

Environmental Science and Engineering

VII. Core Courses

Solid Waste Treatment and Disposal, Air Pollution Control Engineering, Water Pollution Control Engineering, E-waste Resource Technology, Physical Pollution Control, Environmental Impact Assessment, Principles of Environmental Engineering, Environmental Monitoring, Principles and Practice of Ecological Restoration Engineering, Environmental Planning and Management, Environmental Engineering Microbiology, Environmental Chemistry

VIII. Course Structure and Course Hours (excluding Extracurricular Class)

Category	Total Credit	%	Total Course Hours	Theory Learning	Practical Training
Public Fundamental Course	53.5	33	992	912	80
General Education	10	6	160	160	0
Engineering Fundamental Course	12	7	192	160	32
Professional Fundamental Course	24	15	384	352	32
Professional Course	32	19	512	508	4
Professional Practice	32.5	20	928	0	928
Total	164	100	3168	2092	1076
Theory: Practical (%)	66:34				

IX. Teaching schedule (1)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Public Fundamental Course	required	School of Marxism	b1080001	Basic Principles of Marxism	test	3	48	42	6	Autumn 1
	required	School of Marxism	b1080009	Ethics and the Rule of Law	non-test	3	48	42	6	Autumn 1
	required	School of Marxism	b1080006	Outline of Modern Chinese History	non-test	3	48	42	6	Spring 1
	required	School of Marxism	b1080004	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics I	test	3	48	42	6	Autumn 2
	required	School of Marxism	b1080007	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics II	test	2	32	28	4	Spring 2
	required	School of Marxism	----	Situation and Policy (Modules 1 to 4)	non-test	2	32	28	4	Autumn 1 to Spring 2
	required	School of Marxism	b1080008	Labour Education A	non-test	0.5	16	16		Spring 1
	required	College of Arts and Sciences	b1020080+	Advanced MathematicsA1	test	4	64	64		Autumn 1
	required	College of Arts and Sciences	b1020081+	Advanced MathematicsA2	test	4	64	64		Spring 1
	required	College of Arts and Sciences	b1020062	Academic Physics A (Module 1)	test	3	48	48		Spring 1
	required	College of Arts and Sciences	b1020065	Academic Physics B	test	2	32	32		Autumn 2
	required	College of Arts and Sciences	b1020066	Academic Physics C	non-test	2	32		32	Autumn 2
	required	College of Arts and Sciences	b1020012	Linear Algebra	test	2	32	32		Autumn 2
	required	College of Arts and Sciences	b1020013	Probability Theory and Mathematical Statistics	test	2	32	32		Spring 2
	required	College of Arts and Sciences	b1020018	Academic Chinese	non-test	2	32	32		Spring 1
	required	College of Physical Education	----	Physical Education I to VI	non-test	3	160	160		Autumn 1 to Autumn 4
	required	Others	b1110003	Military skills	non-test	0.5	2W			Autumn 1
	required	College of Arts and Sciences	b1110002	Military theory	non-test	0.5	32	32		Spring 1
	required	College of Arts and Sciences	b1020003	General English III	test	3	48	48		Autumn 1
	required	College of Arts and Sciences	b1020004	General English IV	test	3	48	48		Spring 1
required	College of Arts and Sciences	b1020005	General Academic English A	test	2	32	32		Autumn 2	
required	College of Arts and Sciences	---	English Knowledge Expansion	non-test	2	32	32		Spring 2	
required	Others	b1110004	Mental Health Education for University Students	non-test	2	32	16	16	Autumn 1	
Subtotal (Public Fundamental Course)							53.5	992	912	80
General Education	selective	Art Education Center	b0----	Aesthetic Education	non-test	2	32	32		Autumn, Spring
	selective	Each College	b0----	Social Sciences and Humanistic Qualities	non-test	4	64	64		Autumn, Spring
				Natural Sciences and Technology Innovation	non-test	4	64	64		Autumn, Spring
Subtotal (General Education)							10	160	160	

IX. Teaching schedule (2)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester	
Engineering Fundamental Course	required	Engineering Training	b2013127	Fundamentals of Computer and Information Technology	non-test	2	32	32		Autumn 1	
	required	School of Resources and Environment	b2013154hj	Environmental Engineering Cartography	test	3	48	32	16	Autumn 1	
	required	School of Resources and Environment	b2013036hj	Engineering Mechanics	test	2	32	32		Autumn 2	
	required	School of Resources and Environment	b2013064hj	Environmental Fluid Mechanics	test	2	32	32		Spring 2	
	required	Engineering Training	b2090005	Electrical and Electronic Technology	test	3	48	32	16	Autumn 3	
Subtotal (Engineering Fundamental Course)						12	192	160	32		
Professional Fundamental Course	required	School of Resources and Environment	b2013025hj	Introduction to Environmental Engineering	non-test	2	32	32		Autumn 1	
	required	School of Resources and Environment	b2013172hj	Inorganic chemistry	test	3	48	32	16	Autumn 1	
	required	School of Resources and Environment	b2090021hj	Organic Chemistry	test	2	32	32		Spring 1	
	required	School of Resources and Environment	b2013211	Scientific and Technical Paper Writing and Literature Search	non-test	1	16	16		Spring 1	
	required	School of Resources and Environment	b2013157hj	Environmental Engineering Microbiology	test	2	32	32		Spring 1	
	required	School of Resources and Environment	b2090022hj	Analytical Chemistry	test	2	32	32		Autumn 2	
	required	School of Resources and Environment	b2013155hj	Instrumental analysis	test	2	32	32		Autumn 2	
	required	School of Resources and Environment	b2013063hj	Environmental monitoring	test	2	32	32		Spring 2	
	required	School of Resources and Environment	b2090023hj	Physical Chemistry	test	3	48	32	16	Spring 2	
required	School of Resources and Environment	b2013156hj	Principles of Environmental Engineering	test	3	48	48		Spring 2		
required	School of Resources and Environment	b2013061hj	Environmental Chemistry	test	2	32	32		Spring 2		
Subtotal (Professional Fundamental Course)						24	384	352	32		
Professional Course	required	School of Resources and Environment	b2090006hj	Environmental law	non-test	2	32	32		Spring 1	
	required	School of Resources and Environment	b2090007hj	Solid Waste Treatment and Disposal (In Chinese and English)	test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2090008hj	Air Pollution Control Engineering (In Chinese and English)	test	3	48	48		Autumn 3	
	required	School of Resources and Environment	b2090009hj	Water Pollution Control Engineering (In Chinese and English)	test	3	48	48		Autumn 3	
	required	School of Resources and Environment	b2013082hj	Physical contamination control	non-test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2090010hj	E-waste Resource Technology (In Chinese and English)	test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2013159hj	Environmental Engineering Project Management	non-test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2013171hj	Environmental Engineering Technology and Economics	test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2090011hj	Principles and Practice of Ecological Restoration Engineering	test	2	32	32		Spring 3	
	required	School of Resources and Environment	b2013065hj	Environmental Impact Assessment	non-test	2	32	28	4	Spring 3	
	required	School of Resources and Environment	b2013046hj	Environmental Equipment Fundamentals	test	2	32	32		Spring 3	
	required	School of Resources and Environment	b2013060hj	Environmental Planning and Management	non-test	2	32	32		Spring 3	
	Subtotal(Required Professional Course)						26	416	412	4	
	Select different courses in different modules for 6 credits	Module A	b2090012hj	Introduction to Water Supply and Drainage Science and Engineering	non-test	2	32	32		Autumn 3	
			b2013158hj	Environmental Engineering Instrumentation and Automation	test	2	32	32		Spring 3	
			b2013169hj	Environmental Engineering Construction Technology	test	2	32	32		Spring 3	
		Module B	b2090024hj	Purified water treatment processes and facilities	non-test	2	32	32		Autumn 4	
			b2090013hj	Smart environmental technology	non-test	2	32	32		Autumn 4	
			b2013048hj	Environment, Health & Safety	non-test	2	32	32		Autumn 3	
			b2090014hj	Fire and explosion protection theory and technology	non-test	2	32	32		Spring 3	
b2090015hj			Security Management	non-test	2	32	32		Spring 3		
Module C		b2090016hj	Sudden pollution incidents and emergency response	non-test	2	32	32		Autumn 4		
		b2013170hj	Toxic substances in electronic products and prevention	test	2	32	32		Autumn 4		
		b2090017hj	Material flow analysis and resource management	non-test	2	32	32		Autumn 3		
		b2090018hj	Environmental hotspots and case studies	non-test	2	32	32		Spring 3		
		b2013089hj	Circular Economy and Cleaner Production	non-test	2	32	32		Spring 3		
b2090019hj	Life Cycle Assessment and Green Design	non-test	2	32	32		Autumn 4				
b2090020hj	Smart Energy and Carbon Neutrality	non-test	2	32	32		Autumn 4				
Subtotal (Selective Professional Course)						6	96	96			
Subtotal (Professional Course)						32	512	508	4		

IX. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
Professional Practice	required	School of Resources and Environment	b4000010hj	the Program of Environmental Engineering Innovation and Entrepreneurship	non-test	2	48		48	Summer 3
	required	Engineering Training	b4090003	Basic Engineering Training C	non-test	2	48		48	Summer 1
	required	School of Resources and Environment	b4013044hj	Professional Consciousnesses Placement	non-test	1	24		24	Summer 1
	required	School of Resources and Environment	b4013043hj	Organic chemistry experiments	non-test	1	24		24	Summer 1
	required	School of Resources and Environment	b4090004hj	Analytical chemistry experiments	non-test	1	24		24	Autumn 2
	required	School of Resources and Environment	b4013054hj	Instrumental analysis experiments	non-test	1	24		24	Autumn 2
	required	School of Resources and Environment	b4090009hj	Professional Production Internship	non-test	3	72		72	Summer 3
	required	School of Resources and Environment	b4013085hj	Environmental Engineering Microbiology Experiment	non-test	1	24		24	Summer 1
	required	School of Resources and Environment	b4013028hj	Environmental monitoring experiments	non-test	1	24		24	Spring 2
	required	School of Resources and Environment	b4013024hj	Environmental Engineering Principles Experiment	non-test	1	24		24	Summer 2
	required	School of Resources and Environment	b4090007hj	Principles of Environmental Engineering Course Design	non-test	1	24		24	Summer 2
	required	School of Resources and Environment	b4013019hj	Solid Waste Treatment and Disposal Experiment	non-test	1	24		24	Autumn 3
	required	School of Resources and Environment	b4090005hj	Solid Waste Treatment and Disposal Course Design	non-test	1	24		24	Spring 3
	required	School of Resources and Environment	b4013006hj	Air Pollution Control Engineering Experiment	non-test	1	24		24	Autumn 3
	required	School of Resources and Environment	b4013034hj	Water Pollution Control Engineering Experiment	non-test	1	24		24	Autumn 3
	required	School of Resources and Environment	b4013074hj	Atmospheric Pollution Control Engineering Course Design	non-test	1	24		24	Spring 3
	required	School of Resources and Environment	b4013075hj	Water Pollution Control Engineering Course Design	non-test	1	24		24	Spring 3
	required	School of Resources and Environment	b4090008hj	Environmental Engineering Integrated Experiment	non-test	2	48		48	Summer 2
	required	School of Resources and Environment	b4090006hj	Environmental equipment design	non-test	1	24		24	Spring 3
required	School of Resources and Environment	b4013010hj	E-Waste Resourcefulness Course Design	non-test	2	48		48	Autumn 3	
required	School of Resources and Environment	b4013088	Labour Education B	non-test	0.5	16		16	Spring 3	
required	School of Resources and Environment	b4013059hj	Environmental Engineering Graduation Internship and Graduation Design	non-test	6	288		288	Spring 4	
Subtotal(Professional Practice)							32.5	928	928	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	1	-	-	-	Autumn, Spring, Summer
Total							165	3168	2092	1076

1. Description of Selective Professional Course:

Students must take one of the modules and achieve the required number of credits for that module.

Module A: Engineering Technology Direction; **Module B:** Environmental Safety Direction; **Module C:** Low Carbon Management Direction.

2. Explanation of the relevance of professional certificates to the course:

Students, who pass the courses of Environmental Fluid Mechanics, Environmental Engineering Microbiology, Environmental Monitoring, Environmental Planning and Management, Water Pollution Control Engineering, Air Pollution Control Engineering, Solid Waste Treatment and Disposal, Physical Pollution Control, Environmental Impact Assessment, Environmental Law, etc., can take the professional qualification examination related to This program: Environmental Impact Assessment Engineer, Registered Environmental Protection Engineer.

X. Prerequisite for Course Study

No.	Course Name	Prerequisite Course	No.	Course Name	Prerequisite Course		
1	Academic Physics A	Advanced Mathematics A1	13	Environmental Equipment Fundamentals	Solid waste treatment and disposal		
2	Analytical Chemistry	Inorganic chemistry			Water Pollution Control Engineering		
3	Engineering Mechanics	Academic Physics A			Air Pollution Control Engineering		
4	Physical Chemistry	Advanced Mathematics A1	14	Environmental Impact Assessment	Solid waste treatment and disposal		
		Advanced Mathematics A2			Water Pollution Control Engineering		
5	Environmental Chemistry	Inorganic chemistry			15	Environmental Planning and Management	Air Pollution Control Engineering
		Organic Chemistry	Solid waste treatment and disposal				
6	Environmental monitoring	Analytical Chemistry	16	Circular Economy and Cleaner Production			Water Pollution Control Engineering
		Instrumental analysis			Air Pollution Control Engineering		
7	Environmental Fluid Mechanics	Academic Physics A			17	Inorganic chemistry experiments	Solid waste treatment and disposal
		Engineering Mechanics	Water Pollution Control Engineering				
8	Principles of Environmental Engineering	Advanced Mathematics A1	18	Organic chemistry experiments			Air Pollution Control Engineering
		Advanced Mathematics A2			19	Analytical chemistry experiments	Inorganic chemistry
		Inorganic chemistry					Organic Chemistry
		Organic Chemistry	20	Instrumental analysis experiments	Analytical Chemistry		
		Academic Physics A			Instrumental analysis		
9	Probability Theory and Mathematical Statistics	Advanced Mathematics A1	21	Environmental monitoring experiments	Environmental monitoring		
		Advanced Mathematics A2	22	Environmental Engineering Principles Experiment	Principles of Environmental Engineering		
10	Solid waste treatment and disposal	Principles of Environmental Engineering	23	Environmental Engineering Microbiology Experiment	Environmental Engineering Microbiology		
11	Water Pollution Control Engineering	Principles of Environmental Engineering	24	Environmental Engineering Integrated Experiment	Air Pollution Control Engineering Experiment		
		Environmental Engineering Microbiology			Water Pollution Control Engineering Experiment		
12	Air Pollution Control Engineering	Principles of Environmental Engineering					Solid Waste Treatment and Disposal Experiment

XI. Credit of Extracurricular Class

Through taking extracurricular classes, students are encouraged to take part in academic lectures, social practice activities, campus cultural and sports activities, innovative and entrepreneurial activities, voluntary activities, etc. to improve their social adaptability and enhance the competitiveness in the job market. Details are specified in Students' Manual.