

# **Environmental Protection Equipment Engineering**

**(Grade 2022)**

**Course code: 082505T**

## **I. Cultivation Objectives**

### 1. General cultivation objective

This program cultivates talents with comprehensive development of morality, intellect, physique, aesthetics and labor, who have the concept of sustainable development, master relevant basic theories, professional knowledge and engineering technologies of Environmental Engineering, Mechanical Engineering and other disciplines, and possess good professional ethics and strong engineering practice ability, capable of working in pollution prevention and ecological environmental protection, resource recycling and other related fields. They are technically proficient, responsible, international and innovative talents who can work in the fields of pollution prevention and ecological environmental protection, resource recycling and other related fields, such as engineering design, research and development, manufacturing, operation and maintenance management of environmental protection equipment.

### 2. Objective of value guidance

This Program of Environmental Protection Equipment Engineering (PEPE) is in the field of environmental protection, which is based on the core values of socialism and integrates them into the full process of student education. The Program of Environmental Protection Equipment Engineering are actively cultivating students love for the Party and the country and strengthening the foundation of their values.

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

(1) Be able to integrate mathematics, natural sciences, engineering fundamentals and professional knowledge to analyze and solve complex Environmental Protection Equipment Engineering problems, and be competent in engineering design, research and development, manufacturing, operation and maintenance management in fields related to the Program of Environmental Protection Equipment 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 articulate effectively, to work in multidisciplinary teams, and to organize and carry out project implementation.

(4) Possess a certain degree of engineering innovation, global awareness and international perspective, and have the awareness 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 specialist knowledge to complex Environmental Protection Equipment 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 Protection Equipment Engineering problems through literature research in order to reach valid conclusions.

**3: Design/develop of solutions:** Have the ability to design solutions to complex Environmental Protection Equipment Engineering problems and to design environmental protection equipment or processes that meet the requirements of high efficiency, energy efficiency and environmental protection, and 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 Protection Equipment 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 Protection Equipment Engineering problems, including the prediction and simulation of complex Environmental Protection Equipment Engineering problems, and to understand their limitations.

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

**7: Environment and Sustainable Development:** Be able to understand and evaluate the environmental and social sustainability impacts of engineering practices that address complex Environmental Protection Equipment Engineering issues.

**8: Professional Codes:** Have good humanities and scientific 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 Protection Equipment 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 continuously 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, Mechanical Engineering

### **VII. Core Courses**

Engineering Mechanics, Fluid Mechanics and Fluid Machinery, Engineering Drawing, Principles of Environmental Engineering, Mechanical Principles, Environmental Machinery Design, Environmental Engineering, Environmental Machinery Manufacturing, Environmental Equipment Principles and Design, Recycling Processes and Equipment, Environmental Analysis and Monitoring, Environmental Assessment and Planning.

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

<b>Category</b>	<b>Total Credit</b>	<b>%</b>	<b>Total Course Hours</b>	<b>Theory Learning</b>	<b>Practical Training</b>
Public Fundamental Course	53.5	33	992	912	80
General Education	10	6	160	160	0
Engineering Fundamental Course	14	8	224	192	32
Professional Fundamental Course	26	16	416	404	12
Professional Course	29	18	464	432	32
Professional Practice	31.5	19	904	0	904
Total	164	100	3160	2100	1060
<b>Theory: Practical (%)</b>	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	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 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 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	Others	b1110004	Mental Health Education for University Students	non-test	2	32	16	16	Autumn 1
	Academic English (Select 1 module for 10 credits)	Module A	b1020003	General English III	test	3	48	48		Autumn 1
			b1020004	General English IV	test	3	48	48		Spring 1
			b1020005	Academic English A	test	2	32	32		Autumn 2
			---	Foreign Language Expansion	non-test	2	32	32		Spring 2
			b1020002	General English II	test	3	48	48		Autumn 1
		Module B	b1020003	General English III	test	3	48	48		Spring 1
			b1020006	Academic English B	test	2	32	32		Autumn 2
---			Foreign Language Expansion	non-test	2	32	32		Spring 2	
Module C		b1020001	General English I	test	4	64	64		Autumn 1	
		b1020002	General English II	test	3	48	48		Spring 1	
		b1020003	General English III	test	3	48	48		Autumn 2	
★ Academic German		College of Arts and Sciences	b1020040	Academic German I	test	3	48	48		Autumn 1
	College of Arts and Sciences	b1020041	Academic German II	test	3	48	48		Spring 1	
	College of Arts and Sciences	b1020042	Academic German III	test	4	64	64		Autumn 2	
★ Academic Japanese	College of Arts and Sciences	b1020077	Academic Japanese I	test	3	48	48		Autumn 1	
	College of Arts and Sciences	b1020078	Academic Japanese II	test	3	48	48		Spring 1	
	College of Arts and Sciences	b1020079	Academic Japanese III	test	4	64	64		Autumn 2	
<b>Subtotal (Public Fundamental Course)</b>						<b>53.5</b>	<b>992</b>	<b>912</b>	<b>80</b>	
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
<b>Subtotal (General Education)</b>						<b>10</b>	<b>160</b>	<b>160</b>		

(★Note: The first foreign language is 10 credits in total, including 3 languages: Academic English, Academic German and Academic Japanese, choose the appropriate language as required; When Academic English is chosen, please choose the appropriate module in Module A, B, C)

## IX. Teaching schedule (2)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester	
<b>Engineering Fundamental Course</b>	required	Engineering Training	b2013127	Fundamentals of Computer and Information Technology	non-test	2	32	32		Autumn 1	
	required	School of Resources and Environment	b2013212	Engineering Drawing	test	3	48	32	16	Spring 1	
	required	School of Resources and Environment	b2013213	Engineering Mechanics	test	3	48	48		Autumn 2	
	required	School of Resources and Environment	b2013214	Fluid Mechanics and Fluid Machinery	test	3	48	48		Spring 2	
	required	Engineering Training	b2090005	Electrical and Electronic Technology	test	3	48	32	16	Spring 2	
<b>Subtotal (Engineering Fundamental Course)</b>						<b>14</b>	<b>224</b>	<b>192</b>	<b>32</b>		
<b>Professional Fundamental Course</b>	required	School of Resources and Environment	b2013188	Introduction to the Program of Environmental Protection Equipment Engineering	non-test	2	32	32		Autumn 1	
	required	School of Resources and Environment	b2013189	Engineering Academic Chemistry I	test	3	48	48		Autumn 1	
	required	School of Resources and Environment	b2013190	Engineering Academic Chemistry II	test	3	48	48		Spring 1	
	required	School of Resources and Environment	b2013061	Environmental Chemistry	test	2	32	32		Autumn 2	
	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	b2013058	Principles of Environmental Engineering	test	3	48	48		Spring 2	
	required	School of Resources and Environment	b2013037	Tolerance fits and technical measurements	test	2	32	24	8	Autumn 2	
	required	School of Resources and Environment	b2013215	Mechanical principles	test	3	48	48		Spring 2	
	required	School of Resources and Environment	b2013125	Environmental mechanical design	test	3	48	44	4	Autumn 3	
	required	School of Resources and Environment	b2013216	Mechanical engineering materials	test	2	32	32		Autumn 2	
required	School of Resources and Environment	b2013217	Environmental analysis and monitoring	test	2	32	32		Spring 2		
<b>Subtotal (Professional Fundamental Course)</b>						<b>26</b>	<b>416</b>	<b>404</b>	<b>12</b>		
<b>Professional Course</b>	required	School of Resources and Environment	b2013218	Environmental Engineering I (In Chinese and English)	test	4	64	64		Autumn 3	
	required	School of Resources and Environment	b2013219	Environmental Engineering II (In Chinese and English)	test	3	48	48		Autumn 3	
	required	School of Resources and Environment	b2013220	Recycling Processes and Equipment	test	2	32	32		Spring 3	
	required	School of Resources and Environment	b2013044	Environmental machinery manufacturing	test	3	48	36	12	Spring 3	
	required	School of Resources and Environment	b2013221	Principles and design of environmental protection equipment	test	3	48	36	12	Spring 3	
	required	School of Resources and Environment	b2013222	Pipework	test	2	32	28	4	Spring 3	
	required	School of Resources and Environment	b2013223	Principles of engineering control	non-test	2	32	32		Autumn 3	
	required	School of Resources and Environment	b2013224	Environmental assessment and planning	non-test	2	32	28	4	Spring 3	
	required	School of Resources and Environment	b2013225	Environmental Protection Equipment Engineering Construction and Operation	test	2	32	32		Spring 3	
	<b>Subtotal(Required Professional Course)</b>						<b>23</b>	<b>368</b>	<b>336</b>	<b>32</b>	
	Select different courses in different modules for 6 credits	Module A	b2013056	Environmental Engineering Construction Technology	non-test	2	32	32		Spring 3	
			b2013055	Environmental Engineering Technology and Economics	non-test	2	32	32		Autumn 4	
			b2013226	Environmental equipment corrosion and protection	non-test	2	32	32		Autumn 3	
		Module B	b2013227	Environmental instrument analysis and maintenance	non-test	2	32	32		Spring 3	
			b2013228	Modern testing technology and instrumentation	non-test	2	32	32		Autumn 3	
			b2013229	Fire and explosion protection theory and technology	non-test	2	32	32		Spring 3	
			b2013230	Environmental Safety and Emergency Management	non-test	2	32	32		Autumn 4	
		Module C	b2013231	Environmental law	non-test	2	32	32		Spring 3	
			b2013232	Environmental Microbiology	non-test	2	32	32		Spring 3	
b2013089			Circular Economy and Cleaner Production	non-test	2	32	32		Autumn 3		
		b2013126	Principles and techniques of environmental remediation	non-test	2	32	32		Spring 3		
		b2013233	Smart environmental technology	non-test	2	32	32		Autumn 4		
<b>Subtotal (Selective Professional Course)</b>						<b>6</b>	<b>96</b>	<b>96</b>			
<b>Subtotal (Professional Course)</b>						<b>29</b>	<b>464</b>	<b>432</b>	<b>32</b>		

### 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	b4000009	Environmental Protection Equipment Engineering Innovation and Entrepreneurship	non-test	2	48		48	Summer 3
	required	Engineering Training	b4090003	Basic Engineering Training C	non-test	2	48		48	Spring 1
	required	School of Resources and Environment	b4013031	Orientation	non-test	1	24		24	Summer 1
	required	School of Resources and Environment	b4013093	Engineering Academic Chemistry Lab I	non-test	1.5	36		36	Autumn 1
	required	School of Resources and Environment	b4013094	Engineering Academic Chemistry Lab II	non-test	1.5	36		36	Spring 1
	required	School of Resources and Environment	b4013030	Mechanical drawing and mapping	non-test	2	48		48	Summer 1
	required	School of Resources and Environment	b4013023	Principles of Environmental Engineering Course Design	non-test	1	24		24	Summer 2
	required	School of Resources and Environment	b4013084	Professional Production Internship	non-test	2	48		48	Summer 2
	required	School of Resources and Environment	b4013100	Environmental analysis and monitoring experiments	non-test	1	24		24	Spring 2
	required	School of Resources and Environment	b4013101	Environmental Engineering Experiment I	non-test	2	48		48	Autumn 3
	required	School of Resources and Environment	b4013102	Environmental Engineering Experiment II	non-test	1	24		24	Autumn 3
	required	School of Resources and Environment	b4013029	Mechanical Design Course Design	non-test	2	48		48	Spring 3
	required	School of Resources and Environment	b4013103	Environmental Equipment Principles and Design Course Design	non-test	3	72		72	Autumn 4
	required	School of Resources and Environment	b4013104	Environmental Engineering Course Design I	non-test	2	48		48	Summer 3
	required	School of Resources and Environment	b4013105	Environmental Engineering Course Design II	non-test	1	24		24	Summer 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	b4013058	Environmental Protection Equipment Engineering Graduation Internship and Graduation Design (Thesis)	non-test	6	288		288	Spring 4	
<b>Subtotal (Professional Practice)</b>						<b>31.5</b>	<b>904</b>		<b>904</b>	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	1	-	-	-	Autumn, Spring, Summer
<b>Total</b>						<b>165</b>	<b>3160</b>	<b>2100</b>	<b>1060</b>	

#### 1. Description of Selective Professional Course:

**Module A:** Engineering Technology, focusing on the design, construction and economic analysis of projects to develop capacity in environmental engineering project construction

**Module B:** Safety Management, focusing on safety management and relevant laws and regulations, and developing competencies in the safe management of environmental facilities

**Module C:** Environmental Governance, focusing on the introduction of cutting-edge technologies in environmental governance and developing capacity in environmental governance project development

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

In the teaching process of courses such as Environmental Assessment and Planning and Environmental Engineering, most of the contents of professional qualification certificates (Registered Environmental Impact Assessment Engineer and Registered Environmental Protection Engineer) are broken down and completed in the teaching, laying a solid theoretical foundation for professional qualification assessment, which helps improve students' professional quality and employment competitiveness.

## X.Prerequisite for Course Study

No.	Course Name	Prerequisite Course	No.	Course Name	Prerequisite Course
1	Engineering Mechanics	Advanced Mathematics A1, A2	7	Principles of Environmental Engineering	Advanced Mathematics A1, A2
		Academic Physics A			Academic Physics A, B
2	Fluid Mechanics and Fluid Machinery	Academic Physics A	8	Environmental Engineering I and II	Principles of Environmental Engineering
		Engineering Mechanics			Environmental Chemistry
3	Environmental Chemistry	Engineering Academic Chemistry I, II	9	Principles and design of environmental protection equipment	Environmental Engineering I and II
4	Environmental analysis and monitoring	Engineering Academic Chemistry I, II	10	Environmental assessment and planning	Environmental Engineering I and II
5	Mechanical principles	Engineering Mechanics	11	Environmental Protection Equipment Engineering Construction and Operation Management	Environmental Engineering I and II
		Engineering Drawing			Pipework
		Tolerance fits and technical measurements			
6	Environmental mechanical design	Academic Physics A, B	12	Environmental machinery manufacturing	Mechanical principles
		Engineering Drawing			Environmental mechanical design
		Mechanical principles			

## 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.