

Environmental Protection Equipment Engineering

(Grade 2024)

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, especially in municipal solid waste recycling and its process pollution control 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.

Indicator 3-3: Social, health, safety, legal, cultural and environmental factors are integrated in the design.

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 168 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)

Category	Total Credit	%	Total Course Hours	Theory Learning	Practical Training
Public Fundamental Course	56.5	34	1040	950	90
General Education	10	6	160	160	0
Engineering Fundamental Course	14	8	224	176	48
Professional Fundamental Course	28	17	448	430	18
Professional Course	27	16	432	404	28
Professional Practice	31.5	19	904	0	904
Total	167	100	3208	2120	1088
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	b1080010	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	test	3	48	42	6	Spring 2
	required	School of Marxism	b1080011	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	test	3	48	42	6	Autumn 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	School of Mathematics, Physics and Statistics	b1020080	Advanced MathematicsA1	test	4	64	64		Autumn 1
	required	School of Mathematics, Physics and Statistics	b1020081	Advanced MathematicsA2	test	4	64	64		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020012	Linear Algebra	test	2	32	32		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020013	Probability Theory and Mathematical Statistics	test	2	32	32		Autumn 2
	required	School of Foreign Language and Cultural Communication	b1020018	Academic Chinese	non-test	2	32	32		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020062	Academic Physics A (Module 1)	test	3	48	48		Spring 1
	required	School of Mathematics, Physics and Statistics	b1020065	Academic Physics B	test	2	32	32		Autumn 2
	required	School of Mathematics, Physics and Statistics	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	Others	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
	required	School of Foreign Language and Cultural Communication	b1020003	General English III	test	3	48	48		Autumn 1
required	School of Foreign Language and Cultural Communication	b1020004	General English IV	test	3	48	48		Spring 1	
required	School of Foreign Language and Cultural Communication	b1020005	Academic English A	test	2	32	32		Autumn 2	
required	School of Foreign Language and Cultural Communication	---	Foreign Language Expansion	non-test	2	32	32		Spring 2	
required	School of Computer and Information Engineering	b1012001	Artificial Intelligence Application and Practice	non-test	1	16	8	8	Spring 1	
required	School of Resources and Environment	b1012002	Green, Low-carbon and Ecological Civilization	non-test	1	16	16		Autumn 1	
Subtotal (Public Fundamental Course)						56.5	1040	950	90	
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

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester
				Natural Sciences and Technology Innovation	non-test	4	64	64		Autumn, Spring
Subtotal (General Education)						10	160	160		

(★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	
Engineering Fundamental Course	required	Engineering Training	b2090026	Fundamentals of Programming Python	non-test	2	32	16	16	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	Autumn 3	
Subtotal (Engineering Fundamental Course)							14	224	176	48	
Professional Fundamental Course	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	b2013239	Environmental Chemistry (Bilingual)	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	Engineering Training	b2013037	Tolerance fits and technical measurements	test	2	32	24	8	Spring 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	b2013240	Environmental Microbiology (Bilingual)	test	2	32	32		Spring 3		
required	School of Resources and Environment	b2013217	Environmental analysis and monitoring	test	2	32	32		Spring 2		
Subtotal (Professional Fundamental Course)							28	448	430	18	
Professional Course	required	School of Resources and Environment	b2013218	Environmental Engineering I (Bilingual)	test	4	64	64		Autumn 3	
	required	School of Resources and Environment	b2013219	Environmental Engineering II (Bilingual)	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	
	Subtotal(Required Professional Course)							21	336	308	28
	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 3	
			b2013226	Environmental equipment corrosion and protection	non-test	2	32	32		Autumn 4	
b2013222			Pipeline Engineering	non-test	2	32	32		Spring 3		
Module B		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		Autumn 4		
b2013230	Environmental Safety and Emergency Management	non-test	2	32	32		Spring 3				

		b2013231	Environmental law	non-test	2	32	32		Spring 3
		b2013227	Environmental instrument analysis and maintenance	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
		Subtotal (Selective Professional Course)			6	96	96		
		Subtotal (Professional Course)			27	432	404	28	

IX. Teaching schedule (3)

Category	Type	Provided by	Course Code	Course Name	Assessment	Credit	Course Hours	Theory Learning	Practical Training	Recommended semester	
	required	School of Resources and Environment	b4013108	Environmental Protection Equipment Engineering Innovation and Entrepreneurship I	non-test	1	24		24	Spring 1	
	required	School of Resources and Environment	b4000009	Environmental Protection Equipment Engineering Innovation and Entrepreneurship II	non-test	1	24		24	Autumn 2	
	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	b4013106	Environmental Microbiology Experiment	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	b4013107	Environmental Equipment Process Design	non-test	2	48		48	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	
			Subtotal (Professional Practice)				31.5	904		904	
Extracurricular Class	required	Others	b5110001	Extracurricular Class	non-test	1	-	-	-	Autumn, Spring, Summer	
Total							168	3208	2120	1088	

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 Analysis and Governance, focusing on the introduction of cutting-edge technologies in environmental analysis and governance and developing research and development capacity in environmental analysis and 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. 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.