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Undergraduate Program for the Specialty of Environmental Engineering

I ȁ Educational Objectives

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This specialty aims to train the talents with complex engineering skills who are in accordance with national, regional or ethnic minority economic and social development needs, who have the good ideology and morality, humanistic quality, professional ethics and professional dedication, who master the basic knowledge and practical skills of environmental engineering systematically, who have the ability to innovate and continue learning, who adapt to the industry science and technology progress constantly, who can bear the environmental engineering projects and environmental protection management and who can solve the problem of complex environmental

projects. Graduates can be engaged in the work of environmental management, design, research and development for environmental pollution prevention and control projects in government departments, environmental protection companies, industrial and mining enterprises, scientific research institutes and other units. Meanwhile, the graduates can grow into the backbone talents rooted in local, especially in ethnic areas for environmental protection and achieve the following goals:

Goal 1 (knowledge capability): Able to grasp the development status of technologies in environmental engineering, master the basic knowledge of engineering, mathematics and professional knowledge of environmental engineering and provide integrated solutions for complex environmental engineering projects.

Goal 2 (practical ability): Have the systematic thinking and idea of sustainable development, can effectively apply knowledge to the practice of design, construction and operation management, environmental planning and management as well as the environmental monitoring and assessment and have the innovation ability.

Goal 3 (professional quality): Have correct environmental ethics, noble sense of social responsibility and professional ethics, able to communicate effectively with team members, industry peers and publics under the context of globalization and able to coordinate the teams and manage engineering projects.

Goal 4 (potential for development): Have the consciousness of lifelong learning and ability to criticize and reflect, able to keep abreast of the latest theories, technologies and international cutting-edge developments in environmental engineering and can study independently, effectively and continuously to adapt to the diverse development of society and industry.

II à Cultivation Standards

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Length of Schooling

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Duration: 4 years

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Degree

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Degrees Conferred: Bachelor of Engineering

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Basic Requirements for Cultivation

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According to the requirements for cultivation of environmental engineering specialty in our university, we make the graduates in specialty of environmental engineering reach the basic requirements through the study of humanistic and social science, basic engineering, professional basic and professional courses as well as the lectures, social activities, culture activities, competitions, practices, lessons and discussions. The requirements are listed as follow:

1) Engineering Knowledge: Able to use the rationales of natural science and engineering science such as mathematics, physics and chemistry as well as professional knowledge of environmental engineering to solve the complex problems of environmental engineering such as the design, operation and management of treatment for environmental pollutions;

1.1 Able to use the fundamental knowledge of mathematics and engineering mathematics to the expression of engineering problems;

1.2 Understand the rationales of natural science such as physics and chemistry as well as its fundamental applications to recognize problems of environmental pollution;

1.3 Able to apply the fundamental knowledge of lessons in environmental engineering specialty such as the engineering drawing, engineering mechanics, fluid mechanics, environmental engineering microbiology and principles of chemical engineering into the design of environmental pollution control units;

1.4 Able to use the professional knowledge of water, air, solid and physical contamination control to the design, systematic control and improvement.

2) Problem Analysis: Able to apply the rationales, knowledge and references of mathematics,

natural science and environmental engineering to recognize, explain and analyze for requiring effective conclusions;

2.1 Able to use the rationales and professional knowledge of mathematics, natural science and environmental engineering to recognize complex problems of environmental engineering;

2.2 Able to use the concepts, rationales and methods of mathematics, natural science and environmental engineering to analyze and explain the key links and parameters of environmental pollution prevention and control projects;

2.3 Able to use the basic theory and knowledge of environmental engineering as well as references to analyze the factors and related technologies in the process of environmental pollution prevention and make effective conclusions.

3) Designing/developing solutions: Able to use the rationales and methods of water pollution control, air pollution control as well as treatment, disposal and recycling of solid waste to develop and design the technological process and treatment units;

3.1 Able to put forward solutions of complex problems of environmental engineering according to characterizations and prevention requirements of environmental pollution;

3.2 Familiarize and grasp the technical standards, intellectual properties as well as policies and regulations of industry and can do feasibility studies to designing schemes through techno-economic appraisal under the constraint condition of reality;

3.3 Able to design the technology system of pollution control and treatment units, take the factors of society, health, security, law and culture into the design, reflect the sense of innovation and then optimize the design scheme.

4) Research: Able to use the scientific methods and treatments based on principles of environmental engineering to forecast and analyze the problems in technologies of environmental pollution treatments and engineering and provide proper conclusion for solving the complex engineering problems in the practices of environmental pollution treatments;

4.1 Grasp modern analytical method, can recognize the constraint conditions in the complex engineering problems and analyze the basic characterizations of research objects;

4.2 Able to choose proper research routes and design feasible research projects based on professional theories of environmental engineering as well as the characterizations of polluted objects;

4.3 Able to collect and clear up the research data correctly, analyze and deal with the research results and obtain the proper conclusions.

5) Usage of modern tools: Able to develop, choose and use correct technologies and tools of computer aided design in the area of environmental engineering, expertly use modern analytical

instruments and able to forecast, simulate and optimize complex engineering problems in the practices of environmental pollution prevention;

5.1 Able to choose, use and develop correct modern tools such as the computer language programs and software of computer aided design;

5.2 Able to use modern analytical instruments, forecast, simulate and evaluate complex engineering problems, and make clear the boundedness of methods.

6) Engineering and society: Able to solve complex engineering problems based on background knowledge of environmental engineering while simultaneously analyze and evaluate the influences of designing project to society, health, safety, law and culture and understand the responsibility;

6.1 Have practice experiences of environmental engineering and senses of engineering and society;

6.2 Be familiar with the relevant technical regulations, laws and ethnic regional policies in the area of environmental engineering, able to evaluate the influences to society, health, security, law and culture in the process of prevention for environmental pollutions, and understand the responsibilities in the process of prevention for environmental pollutions.

7) Environment and sustainable development: able to understand and evaluate the influences of engineering practices of environmental pollutions prevention to the sustainable progress of environment and society;

7.1 Understand the connotation and meaning of environmental protection and sustainable development of society and know the relevant policies and laws of environmental protection well;

7.2 Able to correctly understand and evaluate the impacts of engineering practices on sustainable development of environment and society in the process of production, operation and maintenance for environmental pollution prevention and control project.

8) Professional norms: have the literacy of humanity and social science as well as responsibility for society, able to understand and comply with the professional ethics and regulations in projects and fulfill the duty;

8.1 Have the scientific world outlook, correct view of life, values and patriotism and have the literacy of humanity and social science as well as responsibility for society;

8.2 understand the core idea of engineering ethics, be familiar with the profession and responsibility of environmental engineer, can comply with the professional ethics and regulations in projects and fulfill the duty.

9) Individuals and teams: have the team spirit in the multi-disciplinary teams of science research, engineering design and practices, ability for organization, management and coordination as well as the adaptive capacities for different roles in the work;

9.1 Able to undertake the roles in the multi-disciplinary teams, Listen to different opinions, have certain ability of organization and management, able to sum up the conclusions of team members and make a proper decision;

9.2 Have strong team work and interpersonal skills, can communicate with other members effectively and properly deal with internal and external relationships of the organization.

10) Communication: have great writing and communicating skills, debate competences, listening skills, application ability for language, able to effectively communicate with industry peers and publics for complex engineering problems, have a certain international vision and able to communicate in a cross-cultural context;

10.1 Have good abilities for writing, communicating and listening;

10.2 Able to express ideas and opinions orally or in writing and effectively communicate with industry peers and publics for complex engineering problems;

10.3 Able to study the international developments of environmental engineering and relevant areas and can have a communication in a cross-cultural context.

11) Project management: able to understand and grasp the principles of engineering management and methods of economic decision and apply the professional knowledge of

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VII ȁ Teaching Schedule Form

ѿ' ˜ / Form I:General Course Platform

ѿˆ A˜' ḱ ˆ ˜ /Form I (A):General Compulsory Courses(General Required)

˜ Course Code	O Course Names	№ Crs.	Hrs.	ﻣﻠﻤ Period Classification				Semester	Notes
				The.	Exp.	Pra..	ʒ̈ Ueb		
109100000418	´ Ƕ Military Theory	2	36	36				1	1-18
109110000318	´ Ƕ Military Training	2	36			36		1	1-2
	ﻳﺠ ﺍﻟ National Security Education	1	32	32				1ˆ ˜	/
20W100000613	1 English 1	2	32	32				1	4-11
218110000313	r 1 Physical Education 1	0/1	26			26		1	4-15
	ň Computer Base ň	1/0.5	32	16	16			1	
217100000313	ḱ ī ƀ Cultivation of Morals and Fundamentals of Law	2.5/0.5	52	40		12		2ˆ ˜	1-14
217100000413	ϟ ƀ Situation and Policy	2	32	32		0		2	1-16
225100000118	Ţ ϟ ˜ □ r Education of Chinese Minzu Community Consciousness	1.5/0.5	32	24		12		2	1-8
20W100000713	2 English 2	2	32	32				2	1-8/9-16
218110000213	r 2 Physical Education 2	0/1	32			32		2	1-16
2171000122	Ţ ﻳﺠ ϟ˘ Essentials of China Modern and Contemporary History	2.5/0.5	52	40		12		3ˆ ˜	1-14
20W100000813	3 English 3	2	32	32				3	1-8/9-16

Course Code	Course Names	№ Crs.	Hrs.	Period Classification				Semester	Notes
				The.	Exp.	Pra..	Ueb		
218110000413	r 3 Physical Education 3	0/1	32			32		3	1-16
112110010718	Labor Education	0/1	32			32		3	1-16
217100000113	Marxist Fundamentals	2.5/0.5	52	40		12		4	1-14
2171000121	Introduction to MAO zedong Thought and Socialist Theoretical System with Chinese Characteristics	4/1	88	64		24		5	1-16
20W100000913	4 English 4	2	32	32				4	1-8/ 9-16
218110000113	r 4 Physical Education 4	0/1	32			32		4	1-16
/	r ^ O ~	0/0.5	16			16		7	1-16
115100000113	Employment Guidance	1	16	16				6	1-8/ 9-16
№ ' №: 39 Demand of Credits:Credits: 39									

B~' ^ ~ /Form I (B): General Elective Courses

Course Classi-fied	№ Crs.
^ ~ General Elective Courses	5

Form II. Basic Course Platform

Course Classified	Numbers of courses	Course Names	Crs.	Hrs.	Period Classification				Semester	Notes
					The.	Exp.	Pra..	Ueb		
Require Basic Courses	2241000066	Introduction to Ethnic Resources and Environmental Protection	1.5	24	24				1	
		Inorganic Chemistry	3	48	48				1	
		Inorganic Chemistry Experiments	/0.5	16		16			1	
		Analytical Chemistry	2	32	32				1	
		Analytical Chemistry Experiments	1	32		32			1	
		A(1) Higher Mathematics A (1)	4	80	64			16	1	
		Linear Algebra	2	48	32			16	1	
	224100000913	Descriptive Geometry & Engineering Drawing	2	32	32				2	
	210102000413	A(2) Higher Mathematics A (2)	5	96	80			16	2	
		B(1) College Physics B (1)	3	56	48			8	2	
	211112000113	B(1) University Physics B(1) Experiments	0.5	16		16			2	
	2241000067	Engineering Surveying	2	32	32				2	

≢ Course Classi-fied	‘ Numbers of courses	O Course Names	№ Crs.	Hrs.	ﷺ Period Classification				Semester	Notes
					The.	Exp.	Pra..	ȝ Ueb		
		ь Probability Theory and Mathematical Statistics	2.5	56	40			16	3	
	211100011218	B^ 2˜	2.0	40	32			8	3	
	211112000213	B^ 2˜	0.5	16		16			3	
ќ Require Basic Courses	213100035218	. Organic Chemistry	3	48	48				3	
	213110036118	. Organic Chemistry Experiments	1	32		32			3	
		. Physical chemistry	3.5	56	56				3	
		. Physical Chemistry Experiments	1	32		32			3	
	2241000068	CAD Environmental Engineering CAD	1	16	16				3	
	2241100069	CAD Environmental Engineering CAD Experiments	1.5	48		48			3	
	2241000070	Electronic Engineering	2.5	40	40				3	
	2241100071	Electronics and Electrotechnics Experiments	0.5	16		16			3	
	2241000073	٦ № Modern Environmental analysis	2	32	32				4	
	2241100074	٦ № Modern Environmental Analysis Experiments	1	32		32			4	

≢ Course Classi-fied	˜ Numbers of courses	O Course Names	№ Crs.	Hrs.	ففم Period Classification				Semester	Notes
					The.	Exp.	Pra..	ʒ Ueb		
	213103016813	r Ʒ Fluid Mechanics	3	48	48				4	
ǩ Require Basic Courses	213113016913	r Ʒ Experiments of Fluid Mechanics	0.5	16		16			4	
	2241000133	Microbiology of Environmental Engineering	2	32	32				4	
	2241100132	Environmental Engineering Microbiology Experiments	0.5	16		16			4	
	213103013213	Ʒ Engineering Mechanics	2.5	40	40				4	
	2241000072	ّ Foundation of Civil Engineering	2	32	32				4	
	213103012113	Project Management	1.5	24	24				5	
№ ' №:60.5 Demand of Credits:Credits: 60.5										

Form III: Major Courses Platform

Course Classified	Course Code	Course Names	Crs.	Hrs.	Period Classification				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Required Courses	213103017113	Environmental Engineering Principle	4	64	64				5	
	213113016213	Principle Experiments of Environmental Engineering	1	32		32			5	
	213103011313	Air Pollution Control Engineering	3	48	48				5	
	2241100127	Experiments of Air Pollution Control Engineering	0.5	16		16			5	
	213103021513	Environmental Monitoring (B)	2	32	32				5	
	213113023813	Environmental Monitoring Experiments (B)	1	32		32			5	
	2241000124	Physical Pollution Control Engineering	2	32	32				5	
	213103029713	Environmental Planning and Management	2	32	32				5	
	213103018313	Water Pollution Control Project (A1)	2	32	32				5	
	213103018613	Water Pollution Control Project (A2)	3.5	56	56				6	1-14
	214113019613	Water Pollution Control Engineering Experiments	1	32		32			6	

≢ Course Classi-fied	˜ Course Code	O Course Names	№ Crs.	Hrs.	فمم Period Classification				Semester	Notes
					The.	Exp.	Pra.	ʒ Ueb		
	2241000137	ﻫ r ƀ Solid Waste Treatment and Disposal	2.5	40	40				6	
Ғ ʒ ḱ Required Courses	2241100136	ﻫ r ƀ Solid Waste Treatment and Disposal Experiments	0.5	16		16			6	
	213103017613	Environmental Engineering Equipment	2	32	32				6	
	213103018013	Environmental Engineering Design	2	32	32				6	
	224100005113	ʒ̈ E Environmental Impact Assessment	2	32	32				6	
	213113018513	ˇ˝ Comprehensive Experiments of Environmental Engineering	2	64		64			6	
	2241000131	Budget Estimates For Environmental Engineering	1.5	24	24				6	
Ғ ʒ ḱ Elective courses	2241000075	Ғ ʒ English for Environmental Engineering	1.5	24	24				6ˆ ~	ḱ 7.5 №˘ 4 ḱ 1.5 №˘ ´E غ ≠ ˇ ḱ 3.0 №
	2241000128	Ḡ ȁ ȁ ‰ Environmental Protection Policies, Regulations and Standards	1.5	24	24				4ˆ ~	
	2241000077	حى ï ضر Ӣ ḱ Remediation of Soil and Groundwater Pollution	1.5	24	24				6ˆ ~	
	224101006013	˚˚ ƀ Cleaner Production and Circular Economy	1.5	24	24				6	

≢ Course Classi-fied	˜ Course Code	O Course Names	№ Crs.	Hrs.	ﻫﻢ Period Classification				Semester	Notes
					The.	Exp.	Pra. .	ʒ Ueb		
	213103018913	L Microbial Engineering for Pollution Control	1.5	24	24				6	
	213103023613	. Advanced oxidation technology	1.5	24	24				6	
	213103017413	Water-related Disaster Prevention and Control	1.5	24	24				7	
	213103020613	ƀ Water Supply and Drainage and Environmental Engineering Construction	1.5	24	24				7	
	213103024313	Membrane Treatment Technology	1.5	24	24				7	
	213103021013	Treatment of Water Supply	1.5	24	24				7	
	213103014513	. Hydrochemistry	1.5	24	24				7	
	213103021413	Ecohydrology	1.5	24	24				7	
	213103022213	ˆ B˜ Environmental Ecology (B)	1.5	24	24				7	
	213103008413	GIS ƀ ﻫﻢ GIS and Environmental Modelling	1.5	24	24				7	
	2241000078	ï Ώ ƀ Document Retrieval and Scientific Paper Writing	1.5	32	16	16			7	

№ ' №: 42 ï Ţ ḱ 34.5 №˘ ḱ 7.5 №

Demand of Creditx:Credits: 42 Required: 34.5 Elective: 7.5

Form IV: Practical Teaching Platform

Category		Course Code	Practical Teaching Name	Crs.	Total Period	Type of Period		Semester	Place
						Exp.	Pra.		
Teaching Practice	Project Design	2241100079	Course Design of Environmental Engineering Principles	1.0	1.0W			5	At School
		213113026613	Course Design of Air Pollution Control Engineering	1.0	1.0W			5	At School
		2241100135	Course Design of Treatment and Disposal of Solid Wastes	1.0	1.0W			6	At School
		213113028013	Course Design of Water Pollution Control Engineering	1.0	1.0W			6	At School
	Preliminary			4	4W				
Teaching Exercitation	Teaching Exercitation	2241100080	Engineering Surveying Practice	0.5	0.5W			2	At School
		224110000213	Engineering Training	1	1W			4	Out of School
		224110006213	Cognition Practice	1	1W			4	Out of School

≢ Category		˜ Course Code	O Practical Teaching Name	№ Crs.	⊔ Total Period	ﻣﻬﻢ Type of Period		Semester	ض Place
						Exp.	ʒ̈ Pra.		
		2241100130	˚˚ ʒ̈ Production Practice	2	2W			7	Out of School
	ʒ ʒ̈ Graduation Practice	2241100134	ʒ ʒ̈ Graduation Practice	2	2W			8	Out of School
	ʒ ˆ ˜ Graduation Project ˆ Thesis˜	224110000113	ʒ ˆ ˜ Graduation Project ˆ Thesis˜	10	10W			8	ṕ At School
	Amount			16.5	16.5W				
Amount		№ Credits 20.5 Period ⊔ Weeks 20.5							

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Form V: Innovation & Entrepreneurship Platform

≢ Category	№ Crs.
⇔ № Innovation Credits	3
⇔ ʒ № Entrepreneurship Credits	2
Amount	5