Undergraduate Program for College of Resources and Environment

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University Profile

South-Central Minzu University is a comprehensive university directly under the State Ethnic Affairs Commission. Located on the shore of the South Lake in Wuhan, home to the ñWhite Clouds and Yellow Cranesò, it is also an institution of higher learning jointly built by the State Ethnics Affairs Commission, the Ministry of Education, provincial government in Hubei and municipal government in Wuhan city. Founded in 1951, SCMZU is one of the earliest universities for nationalities established since the founding of the Peopleôs Republic of China. Since its establishment, SCMZU has been unwavering in following the socialist path of education and implementing the Partyôs policies on education and ethnic affairs. It has achieved rapid and overall development by focusing on forging a sense of the Chinese national community and taking morality and virtue education as the cornerstone.

The university covers a ground area of 1,550 mu and boasts a building area of more than one million square meters. It has a beautiful campus where leafy trees abound and flowers give out fragrances all year around; the campus also features tidily arranged modern buildings with ethnic characteristics. Here the landscape and cultural attractions complement each other, making the campus an ideal place for teaching/learning, scientific research, and living.

The university has laid down a solid foundation for education. Currently it has 29,000 students from all 56 ethnic groups in China, including full-time preparatory students, undergraduates, masterôs students, and doctorate students. It has four doctoral programs of first-level disciplines; 25 academic master programs of first-level disciplines, and 20 professional master programs. It has 82 undergraduate programs, covering 10 major disciplines. It has 34 designated first-class undergraduate programs (14 of which are national programs). With its environmental engineering program obtaining the professional certification for engineering education, the university has been granted four national ñnew engineeringò programs, five ñnew agriculturalò programs, and four ñnew humanitiesò programs. It has nine national first-class undergraduate courses and two ministerial-level ideological and political theory demonstration courses. In January 2018, the university was listed in the ñUniversities to Be Developed as National First-Class Institutions of Higher Learningò in Hubei Province, with its three disciplines of ethnology, chemistry, and pharmaceutical sciences recognized as ñnational first-class discipline development programsò. In 2017, its discipline of ethnology was approved as an A-category discipline in the discipline appraisal by the Ministry of Education; its three disciplines of chemistry, engineering, and material science were placed among the top 1% on the ESI rankings. It has a faculty and staff of more than 1,400, while 58% of the full-time teachers are PhDs. Having a team of Huang Danian-type teachers, who are with high-quality and innovation-driven professionals, it has brought in and cultivated a bunch of top talents such as the ñnational outstanding youthsò, ñnational excellent youthsò, and teachers included in the national ñ10,000 talent initiativeò. During the 13th Five-year Plan period, it was granted 291 national scientific research projects, 36 of which are major projects; it had 761 CSSCI

papers published and 131 of them by authoritative journals such as Social Sciences in China; it had 1,372 SCI papers published, with 279 in the top section; it had 245 high-level academic monographs published, was granted 271 invention patents, and won 123 provincial/ministerial-level prizes and awards; it specified one international standard for mugwort, a Chinese medicinal herb; its Institute of Hubei Comprehensive Moderately Prosperous Society Development was accepted into the China core think tank for the year 2017, while it completed its ñNational Tech Enterprise Incubatorò and its national demonstration base for national ñInternet + Chinese Civilizationò. The university was ranked 86th in terms of quantities of published CSSCI papers in 2019; its natural index was ranked at 124th place in 2020; the humanity and social science edition and natural sciences edition of its journal were both listed as A class for the RCCSE China Core Academic Journal.

The influence of the university has kept increasing over time. In 2012, it was designated as a national demonstration center for teacher development; in 2001, 2006, and 2016 respectively, it obtained top grades in the appraisal of the undergraduate education level by the Ministry of Education. In August 2017, it was honored as ñNational Demonstration University for deepening reform in innovation-driven and entrepreneurship-oriented Educationò. In September 2017, its achievements in talent development were selected into the major exhibition of achievements ñFive Years of Sheer Endeavorò. For the past 70 years, it has accumulatively produced more than 170,000 high-level talents. In recent years, the university undertakes the compilation of the 13th Five-Year Plan for the development of ethnic groups with small populations; making use of its advantages in scientific research, it built multiple industrial development platforms for minority regions; it promoted ñTen Important Projectsò, that is, the appointment of liaison officer in Mount Wuling area dispatched by State Ethnic Affairs Commission;ñ1221òtargeted poverty alleviation program; village-stationed poverty alleviation working team; ò616ò Changyang County-specific Support; Three Gorges Reservoir Area Migration Project-specific support; specific assistance for basic education in Enshi City; PhD service corps; ñthree 10,000ò projects, which are rural development activities carried out by Hubei Provincial Committee of CPC and Hubei provincial government; deputy chief of county in charge of science and technology; support plan for developing high-quality grassroots-level talents. It dispatched a total of 144 cadres and teachers for these efforts and invested more than RMB50 million in various special poverty-alleviation funds. It has entered into strategic partnership agreements with Enshi Prefecture, Tongren City, Zhangjiajie City, Xiangxi Prefecture, Huaihua City, and Qianxinan Prefecture. It has made great efforts to carry out deep cooperation with the Mount Wuling area, Bairin Right Banner, Debao County, Leôan County, and others in terms of talent development, think tank service, scientific research and the commercialization of research achievements, cultural promotion, and the expansion of farm products sales channels. It established relationships of exchanges and cooperation with more than 50 universities overseas, while having deep cooperation with dozens of domestic universities such as Wuhan University and Chongqing University by a way of joint development, exchanges, and mutual visits.

The university has made impressive achievements in morality and virtue education for its students. It has studied and implemented the key message of the Partyôs 19th national congress and consistently implemented the key messages of the CCP Central Committee ethnic work meeting, national ethnic unity and progress award-presenting conference, national conference on ideological and political work in universities, national educational conference, and so forth. Centered on the theme of ñChinese Nation as Family, Working in Unison Toward Chinese Dreamò, it has worked hard on education in ñFive Identitiesò, thus winning such honors as ñExemplary Institution for National Unity and Progressò, ñExemplary Group for National Unity and Progressò, and ñDemonstration University for Building Activities of National Unity and Progress Across Chinaò. For many times its CPC Committee has been honored as ñExemplary Institution in Party Building Workò, ñExemplary Party Committee Central Teamò, and ñExemplary Grassroots Party Cellò by the CPC Committee of Hubei Province. For 19 consecutive years, it has been honored as the Most Civilized Institution of Hubei Province; for many years in a row, it has won the university campus cultural promotion achievement from the Ministry of Education and Hubei Provincial Department of Education; from it came a large number of excellent teachers and students, who have earned honors such as ñNational Exemplary Teacherò, ñNational Role Model in Morality and Virtue as Teacherò, ñTop Ten Head Teacher of Hubei Provinceò, ñChinese University Student of the Yearò, and ñChinese University Student Self-reliance Starò.

In this new era, let us embark on a new journey. Guided by Xi Jinpingôs thought on socialism with Chinese characteristics in the new age, the university will seriously study and implement General Secretary Xi Jinpingôs important thought on strengthening and improving work involving ethnic affairs and his important views on educations. Seizing the opportunities available at this new stage of development, it will practice the new development philosophy. It will get aligned to the stateôs strategy and serve local socioeconomic development. It will focus on forging a sense of the Chinese national community and take morality and virtue education as the cornerstone; by meeting the ñFour Servicesò educational requirements, it will make great efforts to implement the strategy of ñBuilt on Quality, Prospering from Disciplines, Strengthened through Talents, Honored for Characteristicsò. And it will do its best to grow into one of Chinaôs first-class universities to the satisfaction of the Chinese people, fostering constructors and successors for the cause of Chinese style socialism who are developed morally, intellectually, physically and aesthetically.

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College of Resources and

The College offers four undergraduate programs (Environmental Science, Environmental Engineering, Hydrology and Water Resources Engineering, and Resources Circulation Science and Engineering). Both Environmental Science and Environmental Engineering were selected as the strategic new-type (pillar) industrial talent training program for general colleges and universities in Hubei Province. Environmental Engineering was accredited by China Engineering Education Accreditation in 2020 being the first university to be accredited in the National Ethnic Affairs Commission University system. The College offers a doctoral degree program in Environmental Chemistry, an academic master degree program in Environmental Science and Engineering, and a professional master degree program in Resources and Environmental Engineering. Moreover, Environmental Science and Engineering offers position for ñChutianò scholar.

There is a rational composition of staffs and faculties at the college with a number of 50 personal in total. There are 9 full-time professors (Tier II: 1, Tier III: 2), 14 full-time associate professors (3 recognized as outstanding talents in the new century by the Ministry of Education; 1 recognized as expert with outstanding contributions by the National Ethnic Affairs Commission; 2 recognized as young and middle-aged experts with outstanding contributions by Hubei Province). Currently, there is a total number of ~880 undergraduate students and 153 graduate students.

The College has 7,000 square meters of comprehensive laboratory building, including 18 professional teaching laboratories (Environmental Monitoring Laboratories, Hydraulics Laboratories, Environmental Engineering Laboratories, Virtual Simulation Laboratories, etc.) and an additional 400 square meters of Analysis and Testing Center, 1 Weather Station and 1 engineering design library. The college owns the Hubei Province Heavy Metal Pollution Prevention and Control Engineering Technology Research Center, National Ethnic Affairs Commission Key Laboratory of Resource Transformation and Pollution Control and other research institutions. Among them, the "Key Laboratory of Carbon Waste Resource Utilization" has been approved as the national circular economy engineering laboratory in 2016. The college has established exchanges and cooperation with the University of California, the University of Bristol in the United Kingdom, Concordia University in Canada and other universities to promote talent training and scientific research. Practical teaching and industry-academia-research bases have been established with Guangxi CITIC manganese Group, Three Gorges Corporation, Hubei Xingfa Group Co., Ltd, Wuhan Water Group and many other enterprises and environmental protection departments. The college emphasizes on talent training and focuses on the integration of teaching and research. There are 6 existing research groups, namely Heavy metal pollution prevention

and control, Environmental materials and environmental control chemistry, Carbon-based materials and environmental remediation, Ecotoxicology and VOCs pollution control, Resource planning and comprehensive utilization of mineral resources and Water pollution and control. The high-quality academic environment and cutting-edge research platforms all demonstrate the high academic enthusiasm and pragmatic research spirit of the college. In recent years, the college has undertaken more than 240 scientific research projects, including the national science and technology support plan, the subproject of the Ministry of Science and Technology's 863 plan, and the National Natural Science Foundation of China, with a total funding of more than 70 million yuan. Faculties at the college have won 1 special prize and 5 third prize of Hubei Province Science and Technology Progress Award, 1 second prize of Science and Technology Award of the Ministry of Environmental Protection, 1 second prize and 1 third prize of Hubei Province Natural Science Award, , 1 frist prize of Teaching Achievement Award of Hubei Province and 1 first prize of Teaching Achievement Award of National Ethnic Affairs Commission.

The college actively integrates into national development strategies such as the ñBelt and Road Initiativeò and the construction of the Guangdong-Hong Kong-Macao Greater Bay Area, actively expands international and domestic cooperation and exchanges, and has hosted a number of relevant international academic conferences. The college has established exchanges and cooperation with universities such as the University of California, the University of Bristol in the United Kingdom, and Concordia University in Canada, and has created a brand academic exchange column - Nanhu Environmental Forum. Since the establishment of the college, the college has held many large-scale domestic and international academic conferences. In 2016, the college hosted the 16th Satellite Meeting of the World Congress on Catalysis (International Symposium on Environmental Catalysis), the 11th Cross-Strait Catalysis Conference in 2017, the International Symposium on Environment and Energy Science and Technology in 2018 and 2022, and the 2020 Science and Technology Conference of the Chinese Society of Environmental Science (CSES) on "Rural Environmental Governance" in 2020. Additionally, the college and the School of Environment of Tsinghua University co-hosted the Persistent Organic Pollutants (POPs) Forum 2017 and the 12th POPs Colloquium (POPs2017) in 2017. The school's resource and environment-related disciplines have a certain degree of influence in China, especially research in the field of industrial wastewater treatment and environmental catalytic has reached the advanced level in China.

The college implements the fundamental task of "cultivating people with morality", optimizes the working mechanism of "All-round education", takes "cultivating morality, honoring learning, nature, and harmony" as the school motto, and fully implements the undergraduate tutor system,emphasis

equally on the development of moral, intellectual, physical, aesthetics and labor educations.

There is a strong learning atmosphere in classrooms, and all the laboratories are open to undergraduates, encouraging students to carry out scientific research and innovation in their spare time; the College has innovatively carried out the "Green Space" Science and Technology and Culture Festival and the "World Environment Day" and other brand-name student activities, which have further enriched the educational platform of the second classroom and improved the comprehensive quality of the students.

Students have solid professional knowledge, strong innovation abilities and high comprehensive qualities. In recent years, students have won the first and second prizes at the provincial level in the Challenge Cup for college students many times, and have won a number of national competitions such as the National College Students' Energy Saving and Emission Reduction Social Practice and Science and Technology Competition, etc. Several undergraduates have published high-level scientific research papers as the first authors in top SCI journals, and have won the overall champion of the "Garbage Throwing into the Interests - National Youth Public Welfare Practice Competition". Every year, students have won the national, provincial and school-level college student innovation and entrepreneurship training program projects. The completion of the projects lead to registration of a number of start-up companies, as well as the emergence of students such as Yang Chen (Good young people in Hubei Province), and Lan Jirong (national "China Telecom" scholarship recipients).

The employment rate of graduates is high, with over 42.86% of the 2023 graduates going on to graduate school, and many of them have been admitted to famous domestic universities such as Zhejiang University, Wuhan University, Sun Yat-sen University, Huazhong University of Science and Technology, as well as famous foreign universities such as the University of Manchester of the United Kingdom and Seoul National University of South Korea. The employment rate of graduates is stable at about 84.57%, and the employment is mainly distributed in environmental related companies, design and scientific research institutes and other enterprises, as well as the Environmental Protection Bureau, Hydrological Bureau, Bureau of Land and Resources and other civil servants, institutions and departments, and the quality of the training of the students has been praised by the employers, and has gained a good reputation in the society.

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Environmental Engineering Program

The department of Environmental Engineering has customized a complete set of training goals, training plans, graduation requirements, and course quality management system based on the standards of China Engineering Education Accreditation. The philosophy is based on student-centered and output-oriented approaches, and adheres to the concept of sustainable improvement. The goal is to train students to acquire the capability to solve complex environmental engineering problems and to provide graduates with an internationally unified "passport" to the world.

The degree offers fundamental environmental engineering courses (theoretical) such as environmental engineering microbiology, environmental monitoring, environmental engineering principles, water pollution control engineering, air pollution control engineering, physical pollution control engineering, solid waste treatment and disposal, environmental planning and management, and environmental impact assessment. The Environmental Engineering program meets the needs of national, regional, and ethnic minorities' economic and social development, it aims to equip students with good ideological morality, humanistic quality, professional ethics and professionalism. Students should systematically masters the basic knowledge of environmental engineering and pollution control

engineering, resource utilization, and environmental restoration. Students possess theoretical and practical skills, innovative consciousness and continuous learning capabilities and be able to constantly adapt to the scientific and technological progress in the environmental engineering and related industries, and engage in environmental protection undertakings such as the design and operation of environmental pollution control projects, environmental management, environmental monitoring, water and soil environmental protection and restoration technology research and development. The trained students with the above professional talents will grow into the backbone talents who have taken root in local areas, especially in ethnic areas. This undergraduate program adapts a four-year curriculum system. Enrollment is based on the major categories of environmental science and engineering for science oriented students. If they meet the degree-granting conditions upon graduation, they will be awarded a bachelor's degree in engineering.

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The major of Resources Circulation Science and Engineering is an emerging interdisciplinary major, which was set up by the Ministry of Education in 2010 to solve the two fundamental problems of resource shortage and environmental pollution faced by national economic development. In 2011, this major was further approved as the first batch of specialties urgently needed major for the national strategic emerging industries.

The idea of talent cultivation in this major is "broad-caliber, thick foundation, emphasis on ability, and pursuit of innovation". Through a variety of teaching activities, the major has formed a unique talent

cultivation model with the integration of small class teaching, "mentor" leadership and practical innovation. Fundament Resources Circulation Science and Engineering courses (theoretical) such as Resource Processing and Equipment, Chemical Engineering, Metallurgical Engineering, Separation Engineering, Disposal and Reuse of Solid Waste, Recycling Economy and Clean Production, Environmental Engineering, Engineering Surveying, Descriptive Geometry & Engineering Drawing, Resource Microbiology, Programming language (Python)are offered. This major is designed to cultivate professional talents who meet the strategic needs of national and regional low-carbon circular economy industry development, fulfil the concept of the multi-directional resource development, cycling and sustainable utilization of ñresources-products-renewable resources-productsò, master the professional knowledge of development of natural primary resources, comprehensive utilization of secondary resources, cleaner production and circular economy, and resource recycling planning and management, acquire the ability to solve the science and engineering problems of comprehensive utilization of resources and environmental protection, accomplish the work in the field of resource recycling science and engineering, such as scientific research, engineering technology development, process design, industrial management and management planning, et al. This undergraduate program adapts a four-year curriculum system. Enrollment is based on the major categories of environmental science and engineering for science oriented students. If they meet the degree-granting conditions upon graduation, they will be awarded a bachelor's degree in engineering.

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Environmental science is a discipline, seeking the interaction of the development of human society and environmental evolution, and exploring co-evolution of human society and environment as well as

new ways and methods of sustainable development.

The major offers Environmental Chemistry, Modern Environmental Analysis, Environmental Monitoring, Environmental Impact and Assessment, Environmental Ecology, Environmental Toxicology, Environmental Microbiology, Environmental Engineering, Environmental Planning and Management and other fundamental Environmental science courses, focusing on the basic training of pollutant monitoring and analysis, to develop studentsô skills in environmental monitoring and environmental impact assessment. This major is a comprehensive discipline involving the basic movement laws and regulations of the "human-environment" system, which aims to culture talents with the basic theories and skills of environmental science, mastering the basic knowledge of environmental natural science, environmental technology science and environmental humanity and social sciences. After graduation, students can be engaged in the work of environmental management, environmental scientific research, environmental protection product development, environmental monitoring and environmental impact assessment, natural resources and ecological protection and management planning in government, enterprises and institutions. This undergraduate program adapts a four-year curriculum system. Enrollment is based on the major categories of environmental science and engineering for science oriented students. If they meet the degree-granting conditions upon graduation, they will be awarded a bachelor's degree in science.

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Hydrology and water resources engineering is one of the important professional fields in water conservancy, which is the basic industry of the national economy, and an important engineering technology discipline in the development, utilization and management of water resources.

This major offers courses in Physical Geography, Meteorology, Hydraulics, Principles of

Hydrology, Hydrological Statistics, Hydrometry, Hydrological Forecasting, Hydrological Analysis and Computation, Water Conservancy Computation, Water Resources Utilization, Protection of Water Environment, Groundwater Hydrology, Geographic Information System and so on. This major is designed to cultivate engineering professionals who meet the needs of economic and social development of the country, region or ethnic minority, have good moral education, humanistic quality, professional ethics and professionalism, solid basic knowledge and innovative spirit. After graduation, students can be engaged in surveying, evaluating, planning, designing, predicting and forecasting, managing and researching in the fields of hydrology, water resources, water environment and hydroecology in the departments of water conservancy (water affairs), land, energy, transportation, urban construction, agriculture and forestry, environmental protection, geology and mineral. This undergraduate program adapts a four-year curriculum system. Enrollment is based on the major categories of environmental science and engineering for science oriented students. If they meet the degree-granting conditions upon graduation, they will be awarded a bachelor's degree in science.

Major specialization

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Undergraduate Program for Environmental Engineering

E d u c a t i o n S t a n d a r d s

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Length of Schooling

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Duration: four-year

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Degree conferred: Bachelor of Engineering

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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, be able to communicate effectively with team members, industry peers and publics under the context of globalization and be 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, be 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.

Basic Requirements for Graduation

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

1) Engineering Knowledge: Be 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 Be able to use the fundamental knowledge of mathematics and engineering mathematics in 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 Be 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 Be able to use the professional knowledge of water, air, solid and physical contamination control in design, systematic control and improvement.

2) Problem Analysis: Be 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 Be able to use the rationales and professional knowledge of mathematics, natural science and

environmental engineering to recognize complex problems of environmental engineering;

2.2 Be 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 Be 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: Be 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 Be 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 Be 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: Be 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 Be 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 Be 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: Be 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 Be able to choose, use and develop correct modern tools such as the computer language programs and software of computer aided design;

5.2 Be able to use modern analytical instruments, forecast, simulate and evaluate complex

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Core Courses

Microbiology of Environmental Engineering B Environmental Monitoring B Environmental Engineering Principle Physical Pollution Control Engineering Air Pollution Control Engineering A1 Water Pollution Control Project (A1) Environmental Planning and Management A2 Water Pollution Control Project (A2) Solid Waste Treatment and Disposal Environmental Impact Assessment Remediation of Soil and Groundwater Pollution.

Main Internship and Practical Training

Principle Experiments of Environmental Engineering Experiments of Environmental Monitoring Experiments of Environmental Engineering Microbiology Experiments of Water Pollution Control Engineering Experiments of Solid Waste Treatment and Disposal Comprehensive Experiments of Environmental Engineering Course Design of Environmental Engineering Principles Course Design of Air Pollution Control Engineering Course Design of Water Pollution Control Engineering Course Design of Treatment and Disposal of Solid Wastes Engineering Surveying Practice Metalworking Practice Cognition Practice Production Practice Graduation Practice Graduation Design (Thesis).

Hours / Credits

Table of Hours and Credits

Courses Classi		/ Period/	Credits		Proport Credit
			Theor	Pract I&E rs	
General Courses Platform	Compulsory	578	28	3	18.24%
	Elective	144	9	/	5.29%
Basic Courses Platform	Compulsory	1080	47	10	33.53%
Major Courses Platform	Compulsory	616	26.5	6	19.12%
	Elective	96	6		3.53%
Practical Teaching Platform	Compulsory			24.5	14.41%
	Elective				
Quality Developme nt Platform	Innovation & Entrepreneursh ip Credits	Compulsory			5	2.94%
	Other Credits		92	4	1	2.94%

Amount						
	Compulsory Credits	155	Elective Credits	15	Proportion of Elective Credits	8.8%
	Theory Credits	120.5	Practice Credits	44.5	Proportion of Internship and Practical Training	26.17%
The Lowest Graduate Credits		*170*				

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/ Teaching Schedule Form

/ Form : General Course Platform

A /Form I (A):General Compulsory Course

Course	Course Name	Crs	Hrs	Period Cla				Semes
				The	Exp	Pra	Ueb	
20W100000613	1 English 1	2	32	32				1
218110000313	1 Physical Education 1	0/1	26			26		1
217100014918	Moral Education and Rule of Law	2.5/0.5	52	40		12		2
217100015218	Situation and Policy	2	32	32				2
225100000118	Education of Chinese Minzu Community Consciousness	1.5/ 0.5	36	24		12		2
20W100000713	2 English 2	2	32	32				2
218110000213	2 Physical Education 2	0/1	32			32		2
2171000122	Essentials of China Modern and Contemporary History	2.5/ 0.5	52	40		12		3
20W100000813	3 English 3	2	32	32				3
218110015018	3 Physical Education 3	0/0.5	16			16		3
217100012318	The Basic Principles of Maxism	2.5/0.5	52	40		12		4
217100015818	Introduction to MAO Zedong Thought and Socialist Theoretical System with Chinese Characteristics	2.5/0.5	52	40		12		5
217100015918	Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	2.5/0.5	52	40		12		5
20W100000913	4 English 4	2	32	32				4
218110014718	4 Physical Education 4	0/0.5	16			16		4
218110014018	5 Physical Education 3	0/0.5	16			16		5

218110015318	6 Physical Education 3	0/0.5	16			16		6
31 **Demand of Required Credits: 31**								

20W100000813 3 20W100000913 4 20W100001018

20W100001318 20W100001518 20W100001618

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B / Form I (B): General Elective Co

Module	**Crs.**
Psychological Health and Safety	2
Humanistic Accomplishment and Writing	2
Science and Technology & Science Popularization	2
Art Appreciation and Aesthetics	1
Contemporary China and the World	1
Chinese Culture and Civilization	1
9 **Demand of Credits: Elective 9**	

Form II. Basic Course Platform

Cour Cla-s fie	Course	Course Na	Cr	Hr	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
Basic Courses Required	213100035618	B Z Inorganic Chemistry	3	48	48				1	
	213110035818	C Inorganic Chemistry Experiments	/0.5	16		16			1	
	2101000113	A(1) Higher Mathematics A (1)	4	80	64			16	1	
	2101000118	Linear Algebra	2	48	32			16	1	
	213103005213	(B) Analytical Chemistry (B)	2	32	32				1	
	213110036418	B Analytical Chemistry Experiments	1	32		32			1	
	210102000413	A(2) Higher Mathematics A (2)	5	96	80			16	2	
	211100011118	B(1) College Physics B (1)	3	56	48			8	2	
	211110021318	(1) University Physics (1) Experiments	0.5	16		16			2	
	2241000067	Engineering Surveying	2	32	32				2	
	2101000112	Probability Theory and Mathematical Statistics	2.5	56	40			16	3	
	211100011218	B 2	2.0	40	32			8	3	
	211110022818	2	0.5	16		16			3	
	213100047518	(D) Organic Chemistry(D)	2	32	32				3	
	213110036118	(B) Organic Chemistry Experiments (B)	1	32		32			3	
	213100047118	(C) Physical chemistry (C)	2.5	40	40				3	

Cour Cla-s fie	Course	Course Na	Cr	Hr	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
	213110034618	Physical Chemistry Experiments	1	32		32			3	
	224100000913	& Descriptive Geometry & Engineering Drawing	2	32	32				3	
	212100018318	Electronic Engineering	2.0	32	32				3	
	2241100071	Electronics and Electrotechnics Experiments	0.5	16		16			3	
	209100030818	Python Python Language Programming	1/1	48	16		32		3	
	2241000073	Modern Environmental analysis	2	32	32				4	
	2241100074	Modern Environmental Analysis Experiments	1	32		32			4	
	213103016813	Fluid Mechanics	3.0	48	48				4	
	213113016913	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	
	224100021518	Engineering Mechanics	2.0	32	32				4	
	224100025218	Foundation of Civil Engineering	1.5	24	24				4	
	224110023218	CAD Environmental Engineering CAD	2.0	64		64			5	

Cour Cla-s fie	Course	Course Na	Cr	Hr	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
	213103012113	Project Management	1.5	24	24				5	
57 Demand of Credits:Required 57										

Form III: Major Courses Platform

Cour Cla-s fie	Course	Course Na	Cr	Hrs	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
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	B Environmental Monitoring (B)	2	32	32				5	
	213113023813	B Environmental Monitoring Experiments (B)	1	32		32			5	
	2241000124	Physical Pollution Control Engineering	2	32	32				5	
	224100023018	Environmental Planning and Management	1.5	24	24				5	
	224100021618	A1 Water Pollution Control Project (A1)	1.5	24	24				5	
	213103018613	A2 Water Pollution Control Project (A2)	3.5	56	56				6	
	214113019613	Water Pollution Control Engineering Experiments	1	32		32			6	
	224100021818	Wastewater Treatment Engineering Design	1.5	24	24				6	
	224100021918	Environmental Engineering Equipment	1.5	24	24				6	

Cour Cla-s fie	Course	Course Na	Cr	Hrs	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
	224100022318	Environmental Impact Assessment	1.5	24	24				6	
	2241000137	Solid Waste Treatment and Disposal	2.5	40	40				6	
	2241100136	Solid Waste Treatment and Disposal Experiments	0.5	16		16			6	
	213113018513	Comprehensive Experiments of Environmental Engineering	2	64		64			6	
	2241000077	Remediation of Soil and Groundwater Pollution	2	32	32				6	
Elective courses	2241000075	English for Environmental Engineering	1.5	24	24				6	6.0 4 1.5
	224100024718	pedology	1.5	24	24				3	
	224100022718	Environmental Protection Regulations	1.5	24	24				4	
	2241000131	Budget Estimates For Environmental Engineering	1.5	24	24				6	
	224100024218	Cleaner Production	1.5	24	24				6	
	213103018913	Microbial Engineering for Pollution Control	1.5	24	24				6	
	213103023613	Advanced oxidation technology	1.5	24	24				6	
	213103020613	Water Supply and Drainage and Environmental Engineering Construction	1.5	24	24				7	
	213103021013	Treatment of Water Supply	1.5	24	24				7	
	213103014513	B Hydrochemistry	1.5	24	24				7	

Cour Cla-s fie	Course	Course Na	Cr	Hrs	Period Cl				Seme	Not
					Th	Ex	Pr	Ue		
	213103021413	Ecohydrology	1-Ū							

CourseCla		Course	Course N	Crs	/ Tota Per Hou	Period ed		Seme
						Exp	Pra	
Graduatio n Thesis (Project)	Compul sory Course	224110000113	Graduation Project Thesis	10	10W			8
Amount								
: 24.5 24.5 0 Demand of Credits: 24.5, Required24								

Form V: Quality Development Platform

Course	/ Course Nar	Crs.	Hrs.	Period Cla				Seme
				The	Exp	Pra	Uel	
109100000418	Military Theory	2	36	36				1
109100000818	National Security Education	1	16	16				2
		0/1	24			24		1-7
115100000113	Employment Guidance	1	16	16				6
/	Innovation Education	3	/					
/	Entrepreneurship Education	2	/					
10 Demand of Credits: Required 10								

资源循环科学与工程专业本科培养方案

Undergraduate Program for Resources Circulation Science and Engineering

Education Standards

I

Length of Schooling

Duration: 4 years

II

Degree

Degrees conferred: Bachelor of Engineering

II Cultivation Objectives

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This specialty is grounded in the fundamental task of fostering integrity and nurturing talent, with the core objective of solidifying the sense of community among the Chinese nation, and is guided by the commitment to serving the economic and social development of the local regions. The program is designed to educate cross-disciplined senior engineers for engineering technology and engineering management who will have firmer theories and practice foundation of Resources Circulation Science and Engineering, fulfil the concept of the multi-directional resource development, cycling and sustainable utilization of ñresources-products-renewable resources-productsò, master the professional knowledge system of development of natural primary resources, comprehensive utilization of secondary resources, cleaner production and circular economy, and resource recycling planning and management, acquire the ability to solve the science and engineering problems of comprehensive utilization of resources and environmental protection, can accomplish the work in the field of resource recycling science and engineering, such as scientific research, engineering technology development, process design, industrial management and management planning, et al. Graduates can be engaged in the work of management, planning, design, engineering construction, manufacturing, scientific research and education in the field of the Resources Circulation Science and Engineering in government departments, management planning departments, environmental protection departments, design departments, Chemical enterprises, metallurgical enterprises, environmental protection enterprises, industrial and mining enterprises, scientific research institutes, and universities and so on. Also, the graduates can go further study in domestic and foreign scientific research institutions or universities of similar disciplines. Specifically, the following objectives need to be achieved.

Cultivation Objective (knowledge capability): Able to grasp the development status of technologies in Resources Circulation Science and Engineering, master the basic knowledge of engineering, mathematics and professional knowledge, and have the ability to discover, research and solve complex engineering problems independently.

Cultivation Objective II (practical ability): Have the systematic thinking and idea of sustainable development, can effectively apply knowledge to the engineering practice of development of natural primary resources, comprehensive utilization of secondary resources, cleaner production and circular economy, and resource recycling planning and management, and have the innovation ability.

Cultivation Objective III (professional quality): Posses family and country feelings, noble professional ethics, social responsibility and good humanities literacy, have the ability to cooperate and coordinate with competent authorities, industry peers, and related majors, and have certain international vision and cultural exchange ability.

Cultivation Objective IV (potential for development): Have the ability of lifelong learning and certain critical thinking skills, able to keep abreast of the latest theories, technologies and international cutting-edge developments in Resources Circulation Science and Engineering, and can study independently, effectively and continuously to adapt to the diverse development of society and industry.

Basic Requirements for Graduation

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	1	2	3 /	4	5	6	7	8	9	10	11	12
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	H											
CAD	H		M									
CAD			H		H							
	H											
		M			H							
	H											
	H											
	H						H					
		M	M									

Course Class	Course Name	Crs.

Course Class Id	Course Names

and labor education, have a solid foundation of basic knowledge, master basic theories and knowledge relevant to environmental science, be familiar with the migration and transformation as well as control and management of pollutants in various ambient medium, and be skilled in monitoring, assessing, consulting and managing of environmental pollution as well as scientific research. They are qualified to take jobs related to environmental protection in governments, enterprises, colleges and scientific institutes, and grow up to be innovative senior talents in technology and management.

Cultivation Objective (knowledge capability): Able to grasp the development status of environmental science in ecological monitoring and management, and master the basic knowledge of natural science and professional knowledge of environmental science so as to provide solutions for complex environmental problems.

Cultivation Objective (practical ability): Have the systematic thinking and idea of sustainable development, can effectively apply knowledge to monitoring, assessment and management of environment as well as have the innovation ability.

Cultivation Objective (professional quality): Posses family and country feelings, noble professional ethics, social responsibility and good humanities literacy, have the ability to cooperate and coordinate with competent authorities, industry peers, and related majors, and have certain international vision and cultural exchange ability.

Cultivation Objective (potential for development): Have the consciousness of lifelong learning and ability to apply associated knowledge comprehensively, able to keep abreast of the latest theories, technologies and international cutting-edge developments in environmental science so as to adapt to the development of society and industry.

Basic Requirements for Graduation

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The students of this major will learn basic theories and knowledge of natural science and environmental science, and take part in basic professional skill training. They are qualified to be skilled in recognizing, analyzing and resolving environmental problems, and have basic ability to engage in scientific research and management in this field and related fields.

1. Possess generous knowledge of basic natural science, have a good quality of thought and morality as well as humanity.

2. Master basic theories and knowledge of environmental science comprehensively and solidly.

3. Master basic skills of experiments and operation in environmental science, have the primary ability in monitoring, assessing, consulting and managing of environmental pollution.

4. Be familiar with the policy, laws and regulations, standards and norms in relation to environmental protection, resource utilization, sustainable development, and etc.

5. Possess a strong ability in knowledge acquisition and comprehensive application, and have the primary innovation ability in scientific research.

6. Has the ability to conduct a reasonable analysis based on the background knowledge of environmental science, evaluate the impact of engineering practice on the sustainable development of resource, environment and society, and understand the bearing responsibilities.

7. Has good humanities literacy, strong sense of social responsibility, understand and abide the engineering professional ethics and norms in the relevant engineering practice, and fulfill the corresponding responsibilities.

8. Act as individuals, team members and leaders in a multidisciplinary team.

9. Has the ability to effectively communicate with colleagues and the public on complex environmental issues, including writing and designing reports, presenting speeches, clearly expressing or responding to instructions. Communicate with different persons who have cross-cultural background in an international perspective.

10. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Matrice de correspondance entre Graduation Requirements and Education Objec

Cultivation Objectives & Graduation Requirements	1 Cultivation Objective	2 Cultivation Objective II	3 Cultivation Objective III	4 Cultivation Objective
1 Graduation Requirement	ã		ã	ã
2 Graduation Requirement II	ã			ã
3 Graduation Requirement III	ã	ã		
4 Graduation Requirement	ã			ã
5 Graduation Requirement		ã		ã
6 Graduation Requirement		ã	ã	
7 Graduation Requirement			ã	
8 Graduation Requirement			ã	
9 Graduation Requirement		ã	ã	
10 Graduation Requirement				ã

Matrices of relations of courses and Graduation Requirements

Course & Graduation Requirements	1 Graduation Requirement	2 Graduation Requirement II	3 Graduation Requirement III	4 Graduation Requirement	5 Graduation Requirement	6 Graduation Requirement	7 Graduation Requirement	8 Graduation Requirement	9 Graduation Requirement	10 Graduation Requirement
1	H				M				M	M
1	H									L
	H						M			
	H			M		M				
	H						H			
2	H				M				M	M
2	H									L
	H						H			
3	H				M				M	M
3	H									L
	H	M					M			
	H						H			
	H						H			

4	H				M				M	M
4	H									L
5	H									L
6	H									L
B Z	H	M			M					M
C			H		M					M
B	H		M		M					M
B			H		M					M
A(1)	H				M	M				M
	H				M	M				M
A(2)	H				M	M				M
B(1)	H									
(1)			H							
	H		M							
&		H	H							M
	H				M					M
B(2)	H									
(2)			H							
C	H		M		M	L				
B			H		M	L				
B	H				M	L				

			H		M	L				
	M	H				M	L			
CAD		M			M	M	M			
	M	H			M					M
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	M	H			M					
			H		M					
A		H		M		M	M			
A			H		H	M	M			
	M	H			M	M				
			H		M	M				
A		H		M		M			M	
			H						M	
A	M	H			M	M				
		H	H	H		H			H	
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		H	M	L			M			
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	M	H	L	L						M
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Core Courses

Environmental Science Environmental Chemistry Modern Environmental Analysis Environmental Monitoring Environmental Impact and Assessment Environmental Ecology Environmental Microbiology Environmental Soil Science Environmental Engineering

Main Internship and Practical Training

Knowledge Acquirement Environmental Monitoring Practice Environmental Impact and Assessment: Course Design Factory or Graduation Practice Graduation Project (Thesis) Experiments of Modern Environmental Analysis Experiments of Environmental Chemistry Experiments of Environmental Microbiology Experiments of Environmental Monitoring Experiments of Environmental Soil Science Experiments of Environmental Engineering Comprehensive Experiments

Hours/Credits

Table of Hours and Credits

Course Classif			/ Period/	Credits		Propor of Cr
				Theor	Practice	
General Course Platform		Compulsory	578	28	3	18.2%
		Elective	144	9	/	5.3%
Basic Course Platform		Compulsory	912	39	6.5	26.8%
Major Course Platform		Compulsory	600	19.5	9	16.8%
		Elective	400	23	1	14.1%
Practical Teaching Platform		Compulsory	22w		22	12.9%
		Elective				
Quality Development Platform	Innovation & Entrepreneurship Credits	Compulsory	/	/	5	2.9%
	Other Credits		92	4	1	2.9%
Amount	Compulsory Credits	137	Elective Credits	33	Proportion of Elective Credits	19.4%
	Theory Credits	122.5	Practice Credits	42.5	Proportion of Internship and Practical Training	25.0%
The Lowest Graduate Credits		170				

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/ Teaching Schedule Form

/ Form : General Course Platform

A /Form I (A):General Compulsory Course

Course	Course Name	Crs	Hrs.	Period Cla				Semes
				The	Exp	Pra	Ueb	
20W100000613	1 English 1	2	32	32				1
218110000313	1 Physical Education 1	0/1	26			26		1
217100014918	Moral Education and Rule of Law	2.5/0.5	52	40		12		2
217100015218	Situation and Policy	2	32	32				2
225100000118	Education of Chinese Minzu Community Consciousness	1.5/ 0.5	36	24		12		2
20W100000713	2 English 2	2	32	32				2
218110000213	2 Physical Education 2	0/1	32			32		2
2171000122	Essentials of China Modern and Contemporary History	2.5/ 0.5	52	40		12		3
20W100000813	3 English 3	2	32	32				3
218110015018	3 Physical Education 3	0/0.5	16			16		3
217100012318	The Basis Principles of Marxism	2.5/0.5	52	40		12		4
217100015818	Introduction to MAO Zedong Thought and Socialist Theoretical System with Chinese Characteristics	2.5/0.5	52	40		12		5
217100015918	Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	2.5/0.5	52	40		12		5
20W100000913	4 English 4	2	32	32				4
218110014718	4 Physical Education 4	0/0.5	16			16		4
218110014018	5 Physical Education 3	0/0.5	16			16		5

218110015318	6 Physical Education 3	0/0.5	16			16		6
31 **Demand of Required Credits: 31**								

20W100000813 3 20W100000913 4 20W100001018

20W100001318 20W100001518 20W100001618

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B / Form I (B): General Elective Co

Module	**Crs.**
Psychological Health and Safety	2
Humanistic Accomplishment and Writing	2
Science and Technology & Science Popularization	2
Art Appreciation and Aesthetics	1
Contemporary China and the World	1
Chinese Culture and Civilization	1
9 **Demand of Credits: Elective 9**	

Form II. Basic Course Platform

Cour Clas d	Course	Course N	Crs	Hrs	Period Cl				Seme	Notes
					Th	Ex	Pr	Ue		
Basic Courses Required	213100035618	B Z Inorganic Chemistry (B) Z	3	48	48				1	
	213110035818	C Inorganic Chemistry Experiments (C)	0.5	16		16			1	
	2101000113	A(1) Higher Mathematics A (1)	4	80	64			16	1	
	2101000118	Linear Algebra	2	48	32			16	1	
	213103005213	B Analytical Chemistry (B)	2	32	32				1	
	213110036418	B Analytical Chemistry Experiments (B)	1	32		32			1	
	210102000413	A(2) Higher Mathematics A (2)	5	96	80			16	2	
	211100011118	B(1) College Physics B (1)	3	56	48			8	2	
	211112000113	(1) University Physics Experiments (1)	0.5	16		16			2	
	2241000067	Engineering Surveying	2	32	32				2	
	224100000913	& Descriptive Geometry & Engineering Drawing	2	32	32				3	
	2101000112	Probability Theory and Mathematical Statistics	2.5	56	40			16	3	
	211100011218	B(2) College Physics B (2)	2	40	32			8	3	

Cour Clasd	Course	Course N	Crs	Hrs	Period Cl				Seme	Notes
					Th	Ex	Pr	Ue		
	211112000213	(2) University Physics Experiments (2)	0.5	16		16			3	
	213100035218	C Organic Chemistry (C)	3	48	48				3	
	213110036118	B Organic Chemistry Experiments (B)	1	32		32			3	
	213100034518	B Physical chemistry (B)	3.5	56	56				3	
	213110034618	Physical Chemistry Experiments	1	32		32			3	
	224100017818	Environmental Science	2	32	32				3	
	224100024518	CAD Computer Aided Design	1/1.5	64	16	48			4	
	214103026713	Environmental Microbiology	2	32	32				4	
	214113026613									

Cour Clas	Course	Course Na	Crs	Hrs	Period C				Seme	Notes
					Th	Ex	Pr	Ue		
	213103021013	Treatment of Water Supply	1.5	24	24				7	
	213103020613	Water/Wastewater & Environmental Construction	1.5	24	24				7	
: 52.5 (28.5 24) Demand of Credits: 52.5 (Required 28										

Form IV: Practical Course Platform

Course Cl			Course	Course N	Crs	/ Tota Per Ho	Perio Class		Seme
							Exp	Pra	
Practice	Course Practice	Compulsory Courses	112110010718	Labor Education	1	32	ã		1
			109110000318	Military Skill Training	2	36	ã		1
	Project Design	Compulsory Course	224110024818	Environmental Impact and Assessment: Course Design	2.5	2.5			6
	Amount		5.5						
internship	Course internship	Compulsory Course	701110000118	A Engineering Practice A	1	1			5
			2241100080	Engineering Surveying Practice	0.5	0.5			2
			224110018818	Environmental Monitoring Practice	1	1			5
			224110006213	Knowledge Acquirement	1	1			3
	Graduation internship	Compulsory Course	224110000313	Production (or Graduation) Practice	3	3			7
	Graduation Thesis (Project)	Compulsory Course	224110000113	Graduation Project Thesis	10	10			8
	Amount		16.5						
: 22 22 0 Demand of Credit Ele 22 i (Re) i red 22									

Form V: Quality Development Platform

Course	/ Course Na	Crs.	Hrs.	Period Cla				Seme
				The	Exp	Pra	Uel	
109100000418	Military Theory	2	36	36				1
109100000818	National Security Education	1	16	16				2
/		0/1	24			24		1-7
115100000113	Employment Guidance	1	16	16				6
/	Innovation Education	3	/					
/	Entrepreneurship Education	2	/					
Amount		10						
10 Demand of Credits: Required 10								

水文与水资源工程专业本科人才培养方案

Undergraduate Program for Hydrology and Water Resources Engineering

Education Standards

I

Length of Schooling

4

Duration: 4 years

II

Degree

Degrees conferred: Bachelor of Engineering

Cultivation Objectives

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To promote moral education as the fundamental task, to strengthen the sense of community of the Chinese nation as the main task, to serve local economic and social development as the guide, this major aims at cultivating senior engineering professionals who meet the needs of economic and social development of the country, region or ethnic minority, have good moral education, humanistic quality, professional ethics and professionalism, solid basic knowledge and innovative spirit. After graduating 5 years, students can be engaged in surveying, evaluating, planning, designing, predicting and forecasting, managing and researching in the field of hydrology, water resources, water environment and hydroecology in the departments of water conservancy, water affairs, land, energy, transportation, urban construction, agriculture and forestry, environmental protection, geology and mineral and achieve the following goals:

Cultivation Objective (knowledge capability): Be able to grasp the development status of technologies in hydrology and water resources engineering, master the basic knowledge of engineering, mathematics and professional knowledge, and have the ability to discover, research and solve complex engineering problems independently.

Cultivation Objective II (practical ability): Have the systematic thinking and idea of sustainable development, can effectively apply knowledge to the practice of surveying and evaluating, planning and designing, predicting and forecasting, and have the innovation ability.

Cultivation Objective III (professional quality): Patriotic, noble professional ethics, social responsibility and good humanities literacy, have the ability to cooperate and coordinate with competent authorities, industry peers, and related majors, and have certain international vision and cultural exchange ability.

Cultivation Objective IV (potential for development): Have the ability of lifelong learning and certain critical thinking skills, able to keep abreast of the latest theories, technologies and international cutting-edge developments in hydrology and water resources engineering, and can study independently, effectively and continuously to adapt to the diverse development of society and industry.

Basic Requirements for Graduation

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Students in this major learn the basic theories and professional knowledge of mathematics, natural science, hydrology and water resources, water environment, etc., conduct scientific thinking and scientific experimental training in applied basic research and technology development, master the practical skills of engineering measurement, scientific arithmetic, experiments and tests, etc., and be able to apply the basic theories and skills in mathematics, natural science, hydrology and water resources, water environment to analyze and solve the practical problems in this profession and related fields, and have the basic ability to engage in scientific research and organization management in this profession and related fields.

Graduates should acquire the following knowledge, abilities and qualities:

1. Engineering knowledge: Be able to apply basic knowledge of mathematics, natural science and engineering, and professional knowledge of hydrology, water resources and water environment to solve complex engineering problems.

1.1 Master basic knowledge and basic methods of mathematics, natural sciences, and engineering, and be able to apply them to formulate complex engineering problems.

1.2 Be able to construct appropriate mathematical models for complex engineering problems related to hydrology, water resources and water environment, and to derive and solve them.

1.3 Be able to apply relevant knowledge and mathematical modeling methods to the comparison and synthesis of solutions to complex engineering problems related to hydrology, water resources and the environment.

2. Problem Analysis: Be able to apply the basic principles of mathematics, natural sciences, and engineering sciences to identify, express, and analyze complex engineering problems related to hydrology, water resources, and water environment through literature research, and to obtain valid conclusions.

2.1 Be able to apply basic principles of mathematics, natural sciences, and engineering sciences

to identify and express complex engineering problems related to hydrology, water resources, and water environment.

2.2 Be able to analyze complex engineering problems related to hydrology, water resources, and water environment through literature research to obtain valid conclusions.

3. Design / develop solutions: Be able to design solutions to complex engineering problems related to hydrology, water resources and water environment, design systems, units or processes that 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.

3.1 Be able to master design methods and techniques for complex engineering problems related to hydrology, water resources and water environment.

3.2 Be able to carry out specific engineering designs for complex engineering problems related to hydrology, water resources and water environment, and be able to demonstrate a sense of innovation in the design process.

3.3 Be able to consider social, economic, health, safety, ecological, legal, cultural, and environmental factors in specific engineering designs for complex engineering problems related to hydrology, water resources, and water environment.

4. Research: Be able to apply scientific principles and methods to research complex engineering problems related to hydrology, water resources, and water environment, including designing experiments, analyzing and interpreting data, and synthesizing information to reach reasonable and valid conclusions.

4.1 Be able to determine the research route and experimental protocol for complex engineering problems related to hydrology, water resources and water environment through research and analysis based on scientific principles.

4.2 Be able to safely conduct experimental research and properly collect, gather and measure data according to the designed experimental protocol.

4.3 Be able to analyze and interpret experimental results and obtain reasonable and valid conclusions through comprehensive analysis of information.

5. Use modern tools: Be able to develop, select and use appropriate techniques, resources, modern engineering tools and information technology tools for complex engineering problems related to hydrology, water resources and water environment, including prediction and simulation of complex engineering problems, and be able to understand their limitations.

5.1 Understand and master the principles and usage of modern instrumentation, information technology tools and related software commonly used in hydrology, water resources and water environment.

5.2 Be able to select and use appropriate techniques, resources and tools for the analysis, calculation and design of complex engineering problems related to hydrology, water resources and water environment, and understand their limitations.

5.3 Be able to develop, select and use modern tools for the simulation and prediction of complex engineering problems related to hydrology, water resources and water environment, and understand their limitations.

6. Engineering and Society: Be familiar with national and local water-related policies and laws and regulations, and be able to perform reasonablely analysis based on engineering-related background knowledge, evaluate the impacts of professional engineering practices and solutions to complex engineering problems on the society, health, safety, legal, and culture, and understand the responsibilities to be assumed.

6.1 Understand national and local water-related policies and laws and regulations, be familiar with relevant technical standard systems, and understand the impact of ethnicity, customs, religion and other cultures on water-related projects.

6.2 Be able to objectively evaluate the impacts of engineering solutions related with hydrology, water resources, and water environment on the society, health, safety, legal, and culture, and understand the responsibilities that should be assumed.

7. Environment and Sustainable Development: Be able to understand and evaluate the impacts of engineering practices for complex engineering problems related to hydrology and water resources on the environment and sustainable development of society.

7.1 Be able to understand the impacts of engineering practices for complex water-related engineering problems on environment and social sustainability, and develop an awareness of environment and sustainable development.

7.2 Be able to reasonably evaluate the impact of engineering practices related to hydrology, water resources and water environment on the environment and sustainable development of society.

8. Professional norms: Have a deep patriotic spirit, humanistic, social and scientific quality, a sense of social responsibility and a sense of historical mission, and be able to understand and abide by engineering professional ethics and norms and fulfill responsibilities in engineering practice.

8.1 Establish and practice socialist core values, understand the relationship between individuals and society, understand the national conditions of China, and clarify the responsibilities and missions of individuals as builders and successors of the socialist cause.

8.2 Understand the engineering professional ethics and norms of honesty, fairness and integrity, and be able to consciously comply with them in the engineering practice of hydrology and water resources.

8.3 Understand the social responsibility of engineer for the safety, health and welfare of the public, and environmental protection, and be able to consciously fulfill them in engineering practice.

9. Individual and team: Be able to assume the role of individual, team member, and leader in a multidisciplinary team.

9.1 Have good interpersonal skills and certain perform ability, be able to take on individual role in a multidisciplinary team and to take advantage of individual advantages.

9.2 Have certain organizational skills, be able to assume the role of member and leader in a team and play a managerial and coordinating role.

10. Communication and presentation: Be able to communicate effectively and interact with people of the same professionin and the public on complex engineering problems related to hydrology, water resources, and water environment, including writing reports and design briefs, presenting statements, and articulating or responding to instructions. Have a broad international perspective, and be able to communicate and interact in a cross-cultural context.

10.1 Be able to articulate in a variety of forms, both oral and written, for complex engineering problems in hydrology, water resources, and water environment.

10.2 Be able to understand and respect cultural differences and communicate effectively with people of the same professionin and the public on complex engineering problems related to hydrology, water resources, and water environment.

10.3 Have a broad international perspective and foreign language communication skills to communicate in a cross-cultural context on problems related to hydrology, water resources and water environment.

11. Project management: Understand and master the principles of engineering management and economic decision making methods and be able to apply them in a multidisciplinary environment.

11.1 Understand and master the principles of engineering management and economic decision making methods.

11.2 Understand engineering management and economic decision making methods in complex engineering problems related to hydrology, water resources and water environment.

11.3 Be able to master and apply the principles and methods of engineering project management and cost control in a multidisciplinary environment, and have strong project management skills.

12. Lifelong learning: Have the awareness of independent and lifelong learning, and the ability to continuously learn and adapt to development.

12.1 Have the consciousness of self-directed learning and lifelong learning

12.2 Be able to continuously learn and adapt to development.

Matrices of Graduation Requirements and Educati

Cultivation Objectives & Graduation Requirements	1 Cultivation Objective	2 Cultivation Objective II	3 Cultivation Objective III	4 Cultivation Objective
1 Graduation Requirement	ã			
2 Graduation Requirement II		ã		
3 Graduation Requirement III		ã		
4 Graduation Requirement IV		ã		
5 Graduation Requirement V		ã		
6 Graduation Requirement VI			ã	
7 Graduation Requirement VII			ã	
8 Graduation Requirement VIII			ã	
9 Graduation Requirement			ã	ã
10 Graduation Requirement			ã	ã
11 Graduation Requirement			ã	
12 Graduation Requirement II				ã

Matrices of relations of courses and Graduation Requirements

	1.	2.	3. /	4.	5.	6.	7.	8.	9.	10.	11.	12.
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	1.1	1.2	1.3	2.1	2.2	3.1	3.2	3.3	4.1	4.2	4.3	5.1	5.2	5.3	6.1	6.2	7.1	7.2	8.1	8.2	8.3	9.1	9.2	10.1	10.2	10.3	11.1	11.2	11.3	12.1	12.2
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Matlab		M			M			L						H																	M
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Core Courses

Physical Geography Meteorology Hydraulics Principles of Hydrology Hydrological Statistics Hydrometry Hydrological Forecasting Hydrological Analysis and Computation Water Conservancy Computation Water Resources Utilization Protection of Water Environment Groundwater Hydrology Aqueous Environmental Chemistry Geographic Information System and Remote Sensing Applications

Main Internship and Practical Training

Hydraulics Experiments Hydrometry Experiments Experiments for Principles of Hydrology Experiments of Hydrological Forecasting Experiments of Aqueous Environmental Chemistry Experiments of Water Environmental Monitoring Experiments of Water Dynamics Experiments of Geographic Information System and Remote Sensing Applications Experiments of Groundwater Contamination and Protection Project Design for Hydrometry Project Design for Hydrological Statistics Project Design for Hydrological Forecasting Project Design for Groundwater Hydrology Project Design for Hydrological Analysis and Computation Project Design for Water Conservancy Computation Project Design for Water Resources Utilization Project Design for Protection of Water Environment Engineering Training Cognition Practice Production (or Graduation) Practice Graduation Project (Thesis)

Hours / Credits

Table of Hours and Credits

Course Classified			/ Period /	Credits		Proportion Crs.
				Theo	Practice Crs.)	
General Course Platform		Compulsory	578	28	3	18.2%
		Elective	144	9	/	5.3%
Basic Course Platform		Compulsory	944	41.5	6	27.9%
Major Course Platform		Compulsory	672	32	5	21.8%
		Elective	104	5.5	0.5	3.5%
Practical Teaching Platform		Compulsory	68+8W	0	29.5	17.4%
		Elective	/	/	/	
Quality Development Platform	Innovation & Entrepreneurship Credits	Compulsory	/	/	5	2.9%
	Other Credits		92	4	1	2.9%

Amount						
	Compulsory Credits	155	Elective Credits	15	Proportion of Elective Credits	8.8%
	Theory Credits	120	Practice Credits	45	Proportion of Internship and Practical Training	26.5%
The Lowest Graduate Credits		*170*				

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/ Teaching Schedule Form

/ Form : General Course Platform

A /Form I (A):General Compulsory Course

Course	Course Name	Crs	Hrs.	Period Cla				Semes
				The	Exp	Pra	Ueb	
20W100000613	1 English 1	2	32	32				1
218110000313	1 Physical Education 1	0/1	26			26		1

Cour Class	Course	Course Na	Cr	Hr	Period C				Seme	Note
					Th	Ex	Pr	Ue		
Required Courses	224100023718	Geographic Information System and Remote Sensing Application	2	32	32				6	
	224110024318	Experiments of Geographic Information System and Remote Sensing Application	1	32		32			6	
	213103032213	Groundwater Contamination and Protection	2	32	32				6	
	224110020618	Experiments of Groundwater Contamination and Protection	1	32		32			6	
Elective courses	2241000122	Hydro-geochemistry	2	32	32				5	
	213103024513	B Environmental Ecology (B)	2	32	32				5	
	224100019718	Hydrogeological Survey	1.5	24	24				6	6 5
	213103021413	Ecological Hydrology	1.5	24	24				6	2
	213103029813	Professional English for Hydrology and Water Resources	1.5	24	24				7	6 1.5
	213103017413	Water-related Disaster Prevention and Control	1.5	24	24				7	7 2.5
	224100022118	Literature Retrieval and Scientific Paper Writing	0.5/0.5	24	8	16			7	0.5
	224100021718	Hydrological Model of Watershed	0.5/0.5	24	8	16			7	
: 43 37 6 Demand of Credits: 43, Required 37										

Form IV: Practical Teaching Platform

CourseCla			Course	Course N	Crs	/ Tota Per Ho	Period ed		Seme
							Exp	Pra	
Teaching Practice	Teaching Practice	Compulsory Courses	112110010718	Labor Education	1	32	ã		1
			109110000318	Military Skill Training	2	36	ã		1
	Project Design	Compulsory Course	213113031413	Project Design for Hydrometry	1	1W	ã		4
			224110023518	Project Design for Hydrological Statistics	1	1W	ã		4
			2241100129	Project Design for Hydrological Forecasting	1	1W	ã		5
			2241100115	Project Design for Hydrological Analysis and Computation	1	1W	ã		5
			224110023118	Project Design for Groundwater Hydrology	1	1W	ã		5
			2241100116	Project Design for Water Conservancy Computation	1	1W	ã		6
			213113029513	Project Design for Water Resources Utilization	1	1W	ã		6
			224110000813	Project Design for Protection of Water Environment	1	1W	ã		6
	Amount				11	68+8W			
Teaching Exercitation	Teaching Exercitation	Compulsory Course	2241100080	Engineering Surveying Practice	0.5	0.5W		ã	2
			224110006213	Cognition Practice	1	1W		ã	4
			701110000118	A Engineering Training	2	2W		ã	5

CourseCla			Course	Course N	Crs	/ Tota Per Hou	Period ed		Seme
							Exp	Pra	
Teaching Exercitation	Graduation Practice	Compulsory Course	224110000313	Production (or Graduation) Practice	3	3W		ã	7
	Graduation Thesis (Project)	Compulsory Course	224110017618	Graduation Project (Thesis)	12	12W		ã	8
	Amount				18.5	18.5W			
: 29.5 29.5 0 Demand of Credits: 29.5, Required 2									

Form V: Quality Development Platform

Course	/ Course Nar	Crs.	Hrs.	Period Cla				Seme
				The	Exp	Pra	Uel	
109100000418	Military Theory	2	36	36				1
109100000818	National Security Education	1	16	16				2
		0/1	24			24		1-7
115100000113	Employment Guidance	1	16	16				6
/	Innovation Education	3	/					
/	Entrepreneurship Education	2	/					
10 Demand of Credits: Required 10								

环境科学专业（第二学士学位）本科培养方案

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		2.5	0	2	2
		0.5	2	4	2
		0.5	0	0	0
		0	2	0	0
		0	0	0	10
		14	22	10	14

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CAD

	224100017818		2	32	32			1
	224100024518	CAD	1/1.5	64	16	48		2
	224100022818		1.5/0.5	40	24	16		2
	214103026713		2	32	32			2
	214113026613		0.5	16	0	16		2
	2241000073		2	32	32			2
	2241100074		1	32	0	32		2
	224100017918		3	48	48			2
	213113018813		1.5	48		48		2
	213103022413	A	3	48	48			1
	213113023713	A	1.5	48		48		1
	213103016013		2	32	32			1
	213113031313		1	32		32		1
	224100018118	A	3	48	48			1
	224100003213		2	32	32			2
	213103029713		2	32	32			2
	224110022518		2	64		64		3
	224100018018	A	4	64	64			3
	224110004113		2	64		64		4
	224100022118		0.5/0.5	24	8	16		1
	2241000124		2	32	32			2
	213103018913		1.5	24	24			2
	213103022013		2	32	32			3
	213103020913		1.5	24	24			3
	224100024218		1.5	24	24			3
	224100024118		2	32	32			3
	224100022618		2	32	32			3
	213103015413	(A)	2	32	32			3
	224100001713		2	32	32			3
	224100024018		2	32	32			3

	213103017313		2	32	32			4
	224100014918		2	32	32			4
	224100022118		2	2W				2
	224110000113		10	10W				4