Appendix 1-2: 2021 Edition of the Training Program for Water Supply and Drainage Science and Engineering

2021 Edition of the Training Program for Water Supply and Drainage Science and Engineering

1. Professional training objectives

This program aims to cultivate students who adapt to China's new urbanization construction and rural revitalization strategy, meet the needs of regional economic and social development, develop morally, intellectually, physically, aesthetically and laborably, master the basic theoretical knowledge, engineering skills and management methods of the virtuous social cycle process of urban water system, have the ability of teamwork, pioneering and innovative and independent learning, practice the core values of socialism, have a sense of social responsibility and sustainable development, have humanistic qualities, professional ethics and innovation and entrepreneurship awareness, and can be able to ensure water quality safety, In the fields of sewage treatment and recycling, comprehensive improvement of water environment, building water supply and drainage, smart water affairs and engineering management, engaged in design, construction, operation, management and preliminary research and development, and can serve high-quality application-oriented engineering and technical talents in water supply and drainage science and engineering and related industries.

Upon graduation, students in this major are expected to achieve the following objectives:

Training Objective 1: Understand China's current social patterns and norms, possessing good social behavior, team spirit, and awareness of humanistic care. To develop comprehensively in moral, intellectual, physical, and psychological aspects.

Training Objective 2: Master foundational knowledge in mathematics and natural sciences to establish a solid foundation for subsequent course studies and apply this knowledge to solve engineering problems.

Training Objective 3: Master the foundational knowledge of Water Supply and Drainage Science and Engineering, apply this knowledge to identify and analyze complex engineering problems within the field, and lay a solid foundation for further resolving complex engineering issues in Water Supply and Drainage Science and Engineering.

Training Objective 4: Master a broad range of foundational engineering and

professional knowledge to lay the groundwork for future specialized course studies.

Training Objective 5: Master professional knowledge in Water Supply and Drainage Science and Engineering, capable of investigating, designing, and analyzing complex engineering issues in related fields, and proposing solutions that meet the specific needs of complex water supply and drainage engineering problems.

Training Objective 6: Possesses awareness of self-directed and lifelong learning, and the ability to continuously learn and adapt to personal development needs.

2. Learning Outcomes

(1) Foundational Scientific and Engineering Literacy

- Ability to apply mathematics, physics, chemistry, and biology to solve water-related engineering problems (e.g., pipe flow calculations, water quality analysis).
- Understanding of industry workflows (e.g., water treatment processes, urban drainage systems) and their technical requirements.
- Awareness of current trends in sustainable water technologies (e.g., rainwater harvesting, smart water networks).

(2) Core Professional Knowledge and Skills

- Mastery of fundamental theories in water supply systems, drainage engineering, hydraulics, and environmental hydrology.
- Ability to design and operate water infrastructure (e.g., pump stations, sewage treatment units) under supervision.
- Skill in applying national standards (e.g., drinking water safety codes, drainage design specifications) to practical projects.
- Capacity to learn independently and adapt to new technologies in water engineering.

(3) Digital Tools and Data Application

- Proficiency in industry software for hydraulic modeling and system design.
- Ability to retrieve and analyze data from technical documents, environmental databases, and academic resources.
- Skill in integrating computational tools into tasks like network simulation or project documentation.

(4) Practical Problem-Solving in Engineering

- Ability to design water supply/drainage systems that meet technical, economic, and environmental constraints.

- Competence in troubleshooting common issues (e.g., pipe blockages, water quality fluctuations) through systematic methods.
- Awareness of social impacts (e.g., public health, community needs) in engineering decisions.
- Skill in evaluating cost-effectiveness and safety of small-scale water infrastructure projects.

(5) Global Communication and Collaboration

- Basic English proficiency to read technical manuals, collaborate in multicultural teams, and present project outcomes.
- Understanding of international frameworks in local engineering contexts.

(6) Professional Ethics and Teamwork

- Commitment to ethical practices (e.g., environmental protection, transparency in project execution).
- Ability to work effectively in teams, contribute to task division, and communicate technical ideas clearly.
- Resilience in handling routine challenges.

3. Graduation Requirements

Graduates of this programme should meet the following graduation requirements:

Support the leadership of the Communist Party of China, love the socialist motherland, master Marxism, Mao Zedong Thought and the theoretical system of socialism with Chinese characteristics, have a correct world outlook, outlook on life and values, abide by discipline and law, unite and cooperate, love and dedication, and be willing to contribute.

I. Engineering knowledge: have the ability to apply mathematics, natural science, engineering foundation and professional knowledge to solve complex engineering problems such as engineering planning, design, construction, operation and management of water supply and drainage science and engineering.

II. Problem analysis: be able to apply the basic principles of mathematics, natural science, engineering and water supply and drainage science and engineering, identify and analyze complex problems in water supply and drainage science and engineering by consulting literature, and put forward feasible ideas to obtain effective conclusions.

III. Design/development solutions: be able to propose effective and reasonable

design solutions for complex problems in the field of water supply and drainage science and engineering, design systems, processes or process units that can meet specific needs, and be able to reflect the sense of innovation in the design process, and consider the impact of social, health, safety, legal, cultural and environmental factors.

IV. Research: Be able to design experiments, obtain, analyze and interpret data on complex problems of water supply and drainage science and engineering based on the basic principles of water supply and drainage science and engineering, and obtain reasonable and effective conclusions through information synthesis.

V. Use modern tools: be able to develop, select and use appropriate technologies, resources, modern engineering tools and information technology tools for complex problems in water supply and drainage science and engineering, and be able to use mathematics, engineering, management and other models and methods to simulate, simulate, analyze, predict and optimize complex engineering problems, and understand their limitations.

VI. Engineering and Society: Be able to reasonably analyze and evaluate the impact of engineering practices and solutions to complex engineering problems on society, health, safety, law and culture based on the background knowledge of water supply and drainage science and engineering, and understand the responsibilities that should be assumed.

VII. Environment and sustainable development: have the awareness of harmonious development between man and nature, have the knowledge of environmental protection, adhere to the concept of sustainable social development, and be able to understand and evaluate the impact of engineering practice to solve complex engineering problems on social, environmental and economic sustainable development.

VIII. Professional norms: practice the core values of socialism, have humanities and social science literacy and social responsibility and social responsibility, be able to understand and abide by professional ethics and engineering ethics in the engineering practice of the program, and fulfill responsibilities.

IX. Individuals and teams: be able to assume the roles of individuals, team members and leaders in teams in a multidisciplinary background, with strong collaborative spirit and certain organizational management skills.

X. Communication: Be able to effectively communicate and exchange with

industry peers and the public on complex issues of water supply and drainage science and engineering, including writing reports and design manuscripts, drawings, statements, written or oral expressions or responding to instructions, mastering a foreign language, having certain listening, speaking, reading and writing skills, and having a certain international vision, and being able to communicate and exchange in a cross-cultural context.

XI. Project Management: Understand and master the management principles and economic decision-making methods of water engineering projects, and be able to apply them in a multidisciplinary environment. Have certain organizational and management skills.

XII. Continuous learning: have the awareness of independent learning and lifelong learning, and have the ability to continuously learn and adapt to their own development needs.

4. Program Distinctiveness

1. Connect with the main battlefield of new urbanization, focus on the integration of industry and education, and cultivate application-oriented talents with equal emphasis on design and management;

2. Align with the national rural revitalization strategy, focus on the "integration of urban and rural water supply", and cultivate high-quality application-oriented talents in the field of urban construction.

5. The main disciplines

Civil engineering

6. Professional core courses

Water Resources Utilization and Protection, Water Supply and Drainage Pipe Network System (1), Water Supply and Drainage Network System (2), Building Water Supply and Drainage Engineering, Water Quality Engineering (1), Water Quality Engineering (2), Water Engineering Construction, Water Process Equipment Foundation, Water Supply and Drainage Engineering Instrumentation and Control

7. Main practical teaching links

Program professional experiments: university physics experiments, water analytical chemistry experiments, water treatment biology experiments, hydraulic experiments, water quality engineering experiments.

Program professional internships (training): understanding internship, electrical and electronic training A, surveying practice, metalworking practice, production practice, graduation internship.

Program professional course design (thesis): pump and pumping station course design, building water supply and drainage engineering course design, water supply pipe network system course design, drainage pipe network system course design, water supply treatment course design, sewage treatment course design, water engineering economics and budget estimation course design, graduation comprehensive training.

8. Duration and degree awarded

Standard duration: 4 years, 3-6 years of study; Those who meet the requirements of the "Implementation Rules for the Conferment of Bachelor's Degrees by Hunan City University" will be awarded a bachelor's degree in engineering.

9. Distribution of Total Graduation Hours

Course Module	Contact Hours	Self-study Hours	Total Hours	Percentage
Humanities and Social Sciences	978	717	1695	24.6%
Mathematics and Natural Sciences	424	386	810	11.7%
Professional Foundation	280	215	495	7.1%
Engineering Foundation	288	297	585	8.5%
Professional Core	448	407	855	12.4%
Engineering Practice	1312	1148	2460	35.6%
Total Hours	3730	3170	6900	

10. Talent training program schedule

1. Teaching schedule

Module	Curriculum	Chinese credits	Credit	total class hours	Contact hours	Self-study hours	Remarks
Humanities and Social Sciences	Ideological, Moral and Legal Studies	3	3	90	48	42	
	Outline of Modern and Contemporary Chinese History	3	3	90	48	42	
	Basic Principles of Marxism	3	3	90	48	42	
	Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics,	5	5	150	80	70	
	An Introduction to Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era	3	3	90	48	42	
	Current Affairs and Policies	2	2	60	32	28	
	College English (1)	2.5	2.5	75	40	35	
	College English (2)	3.5	3.5	105	56	49	
	Extended College English Series (1)	1.5	1.5	45	24	21	
	Extended College English Series (2)	1.5	1.5	45	24	21	
	Practical Writing,	1	1.5	45	32	13	
	College Student Psychological Health Education	1	1.5	45	32	13	
	College Student Career Development and Employment Guidance (1)	0.5	1	30	20	10	

	College Student Career Development and Employment Guidance (2)	0.5	1	30	18	12	
	Basics of Innovation and Entrepreneurship	1	1.5	45	32	13	
	College Military Theory	2	2	60	36	24	
	College Sports and Health (1)	1	1.5	45	32	13	
	College Sports and Health (2)	1	1.5	45	32	13	
	College Sports and Health (3)	0.5	1	30	20	10	
	College Sports and Health (4)	0.5	1	30	20	10	
	Arts and Physical Education Elective	2	2	60	32	28	
	Humanities and Social Sciences Elective	2	2	60	32	28	
	Innovation and Entrepreneurship	2	3	90	32	58	
	Freshman Orientation and Military Training	0	4	120	96	24	
	Public Welfare Labor	1	2	60	32	28	
	Social Practice and Volunteer Services	1	2	60	32	28	
Mathematics and Natural Sciences	Advanced Mathematics A (1)	4.5	4.5	135	72	63	
	Advanced Mathematics A (2)	5	5	150	80	70	
	Linear Algebra	2	2	60	32	28	
	Probability and Mathematical Statistics	2.5	2.5	75	40	35	
	College Physics A (1)	3	3	90	48	42	
	College Physics A (2)	3	3	90	48	42	
	College Physics Laboratory	0.5	1.5	45	16	29	
	General Chemistry	2	2	60	32	28	
	Organic Chemistry	1.5	1.5	45	24	21	
	Physical Chemistry	2	2	60	32	28	

Basic Professional Courses	Introduction to Water Supply and Drainage Science and Engineering	1	2	60	16	44	
	Hydraulics	3	3	90	56	34	
	Analytical Water Chemistry	2.5	2.5	75	48	27	
	Hydrology and Hydrogeology	2	2	60	32	28	
	Biology for Water Treatment	2.5	2.5	75	48	27	
	Basics of AutoCAD	0.5	1.5	45	32	13	
	Computer Applications in Water Supply and Drainage Engineering (including BIM Technology)	1	2	60	32	28	
	Professional English on Water Supply and Drainage Engineering	1	1	30	16	14	
Basic Engineering Courses	Basic Computer Science for College Students	1.5	1.5	45	32	13	
	Computer Programming (C Language)	3	3	90	32	58	
	Engineering Drawing	2.5	2.5	75	40	35	
	Electrical engineering and electronics	2	2	60	32	28	
	Engineering Mechanics	2.5	3	90	40	50	
	Civil Engineering Fundamentals Water Engineering	1.5	2	60	24	36	
	Water Engineering Economics and Budgeting	2	2	60	32	28	
	Engineering Geomatics	2	2	60	32	28	
	Project Management in Construction	1.5	1.5	45	24	21	
Core Professional Courses	Pumps and Pumping Stations	2	2	60	32	28	
	Water Quality Engineering Experiments	1	1.5	45	16	29	
	Water Resources Utilization and Protection	2	2	60	32	28	
	Water Supply and Drainage Network Systems (1)	2	3	90	48	42	
	Water Supply and Drainage Network Systems (2)	2	3	90	48	42	
	Building Water Supply and Drainage Engineering	3	3	90	48	42	

	Water Quality Engineering (1)	**2.5**	**3**	**90**	**40**	**50**	
	Water Quality Engineering(2)	**3**	**3**	**90**	**48**	**42**	
	Water Engineering Construction	**2**	**2**	**60**	**32**	**28**	
	Water Process Equipment Basics	**2**	**2**	**60**	**32**	**28**	
	Water Supply and Drainage Engineering Instrumentation and Control	**1.5**	**1.5**	**45**	**24**	**21**	
	Interpretation and Application of Water Supply and Drainage Design Standards	**0.5**	**1**	**30**	**16**	**14**	
	Water Engineering Operation and Intelligent Management.	**1.5**	**1.5**	**45**	**32**	**13**	
Engineering Practice Courses	**Electrical and Electronic Engineering Practical Training A**	**1**	**2**	**60**	**32**	**28**	
	Geomatics Internship	**1**	**2**	**60**	**32**	**28**	
	Familiarization Internship	**1**	**2**	**60**	**32**	**28**	
	Pump and Pump Station Course Design	**1**	**2**	**60**	**32**	**28**	
	Building Water Supply and Drainage Course Design	**2**	**4**	**120**	**64**	**56**	
	Water Supply Network Course Design	**2**	**4**	**120**	**64**	**56**	
	Drainage Network Course Design	**2**	**4**	**120**	**64**	**56**	
	Water Treatment Course Design (including practical training at a water treatment plant)	**2**	**4**	**120**	**64**	**56**	
	Wastewater Treatment Course Design (including practical training at a wastewater treatment plant)	**2**	**4**	**120**	**64**	**56**	
	Water Engineering Economics and Preliminary Budget Course Design	**1**	**2**	**60**	**32**	**28**	
	Production Internship	**8**	**16**	**480**	**256**	**224**	
	Metalworking Internship	**2**	**4**	**120**	**64**	**56**	
	Graduation Internship	**2**	**4**	**120**	**64**	**56**	

	Comprehensive Graduation Training	**13**	**26**	**780**	**416**	**364**	
	Graduation Education	**0**	**2**	**60**	**32**	**28**	

2. Courses in different semester

First academic year													
	Course code	Course name	total Hours	theory Hours	practice Hours	online Hours		Course code	Course name	total Hours	theory Hours	practice Hours	online Hours
First Semester	9123311031	Ideology, morality and the rule of law	48	32	8	8	**Second Semester**	9124311041	Outline of Modern Chinese History	48	32	8	8
	9054311011	College English(1)	40	40				9054311021	College English(2)	56	56		
	9051111050	Practical Writing	16	16				9131311010	Mental health education for college students	32	8	20	4
	9132311020	Military Theory for College Students	36	8	24	4		9163311010	Foundation of innovation and entrepreneurship	32	4	24	4
	9063311011	Computer Fundamentals for College Students	32	16	16			9063311021	Computer language (C language).	64	32	32	

	9103811010	University Physical Education and Health (1)	32	20	12			9103811020	University Physical Education and Health (2)	32	20	12	
	9092112011	Further Mathematics A(1)	72	72				9092112021	Further Mathematics A (2)	80	80		
	9112112111	Engineering Drawing	40	40				9065112011	College Physics A (1)	48	48		
	9021312371	General Chemistry	32	24	8			9021312381	organic chemistry	24	20	4	
	9021112010	Introduction to Water Supply and Drainage Science and Engineering	16	16				9125111050	Situation and Policy (2)	8	8		
	9125111050	Situation and Policy (1)	8	8				9021324170	AutoCAD Basics	16		16	
	9122311030	Entrance education and military training	3 weeks		3 weeks			9141315010	Social Practice and Volunteering	1 week		holiday	
	9123315010	Public Welfare Labor	1 week		1 week								
Second academic year													

	Course code	Course name	total Hours	theory Hours	Practical hours	online Hours		Course code	Course name	total Hours	theory Hours	practice Hours	online Hours
First Semester	9121311011	Basic Principles of Marxism	48	32	8	8	**Second Semester**	9122311021	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	80	64	8	8
	9054311031	College English Enrichment Series (1)	24	24				9125111050	Situation & Policy (4)	8	8		
	9103811030	University Physical Education and Health(3)	20	20				9054311041	College English Extension Series (2)	24	24		
	9092112051	linear algebra	32	32				9151311010	Career Development and Career Guidance for College Students (1)	20	4	12	4
	9065212030	University Physics Experiments	16		16			9103811040	University Physical Education and Health (4)	20	20		

	9065112021	College Physics A(2)	48	48				9092112061	Probability Theory and Mathematical Statistics	40	40		
	9021312391	physical chemistry	32	28	4			9021312401	Water Analytical Chemistry	48	32	16	
	9061312300	Electronics	32	28	4			9021112361	Hydrology and Hydrogeology	32	32	The first half	
	9034112101	Engineering mechanics	40	40				9021312041	Pumps & Pumping Stations	32	28	4	8
	9021312021	hydraulics	56	32	16	8		9021112410	Civil engineering foundations	24	24		
	9024312821	Engineering Surveying	32	28	4			9021113431	Water resource utilization and conservation	32	24	The second half	8
	9161715010	Electronic and Electrician Training A	1 week		1 week			9021615470	Meet the internship	1 week		1 week	
	9024715810	Surveying Practicum	1 week		1 week			9021415250	Pump & Pumping Station Course Design	1 week		1 week	
	9125111050	Situation & Policy (3)	8	8									
Third academic year													

	Course code	Course name	total Hours	theory Hours	practice Hours	online Hours		Course code	Course name	total Hours	theory Hours	practice Hours	online Hours
First Semester	9021113081	Water Supply and Drainage Network System(1)	32	24		8	**Second Semester**	9151311020	Career Development and Career Guidance for College Students(2)	18	2	14	2
	9021113091	Water Supply and Drainage Network System(2)	32	32				9021213140	Water quality engineering experiments	32	8	24	
	9021313101	Building water supply and drainage works	48	48				9021113111	Water Quality Engineering(1)	40	40		
	9021324190	Fundamentals of Computer Application in Water Supply and Drainage Engineering (including BIM)	32	8	24			9021113121	Water Quality Engineering(2)	48	36		12
	9021312051	Biology of water treatment	48	32	16			9021113130	Water engineering construction	24	24		

	9021824210	Interpretation and application of water supply and drainage design codes	16		16			9021113440	Fundamentals of water process equipment	32	32		
	9021415260	Design of building water supply and drainage courses	2 weeks		2 weeks			9021112421	Economics and budget estimates for water projects	32	24		8
	9021415270	Water supply network course design	2 weeks		2 weeks			9021415300	Water supply treatment course design (including waterworks engineering practice ability training)	2 weeks		2 weeks	
	9031415280	Drainage network course design	2 weeks		2 weeks			9021415310	Sewage treatment course design (including practical training of sewage treatment plant engineering)	2 weeks		2 weeks	
								9021415480	Economics and Budget Estimation for Water Engineering devise	1 week		1 week	
Fourth academic year													

	Course code	Course name	Total credit hours	Theoretical hours	practice Hours	Online hours		Course code	Course name	Total credit hours	theory Hours	practice Hours	
First Semester	9021113160	Instrumentation and control of water supply and drainage engineering	24	24			**Second Semester**	9021515350	Graduation comprehensive training	13 weeks		13 weeks	
	9041124010	Engineering project management	24	24					Graduation education	1 week		1 week	
	9021113200	Professional English	16	16									
	9021824430	Water engineering operation and intelligent management	24	24									
	9021715450	Metalworking internship	1 week		1 week								
	9021615440	Production Internship	8 weeks		8 weeks								
	9021615340	Graduation Internship	2 weeks		2 weeks								

Note: The graduation comprehensive training is the graduation project, and the students mainly complete the municipal water supply direction, municipal drainage direction, and building water supply and drainage engineering direction, and complete the graduation project. The design of pipe network and water plant shall be completed in the direction of water supply and drainage, and the design of building water supply system, building drainage system, building fire protection system, building hot water system and other systems shall be completed.

10. Decomposition of Graduation Requirements and Achievement Matrix of Talent Training Standards

The decomposition of graduation requirements is shown in Table 10-1. Based on the training objectives and basic requirements of graduates, a curriculum system is constructed, and the implementation of the curriculum system achieves the training objectives and basic requirements. The correspondence between the basic requirements of graduates and the training objectives of this major is shown in Table 10-2. Table 10-3 shows the correspondence between the teaching segments and graduation requirements formed after the analysis of indicators for graduation requirements in this major, which is the matrix of correspondence between the professional curriculum system and the basic requirements of graduates.

Table 10-1 Decomposition of Graduation Requirements

Graduation Requirements	Secondary Indicator Points
(1) Engineering Knowledge: Acquire mathematical, natural science, engineering fundamentals, and professional knowledge to solve complex engineering problems in the field of water supply and drainage science and engineering related to engineering planning, design, construction, operation, and management.	1.1 Master mathematical knowledge related to water supply and drainage science and engineering to understand basic principles of the profession.
	1.2 Apply physics, chemistry, biology, and other knowledge to describe and explain important phenomena in complex water supply and drainage science and engineering problems.
	1.3 Utilize mechanics, engineering knowledge in engineering planning, design, construction, and operation management.
	1.4 Apply professional knowledge in the field of water supply and drainage science and engineering and engineering management to solve complex engineering problems in water supply and drainage projects.
(2) Problem Analysis: Apply mathematical, natural science, engineering, and basic principles of water supply and drainage science and engineering to identify and analyze complex problems in the field. Propose feasible solutions through literature research to obtain effective conclusions. Problem Analysis: Being able to apply the fundamental principles of	2.1 Capable of integrating the principles and methods of mathematics, natural sciences, engineering, and water supply and drainage science and engineering, possessing the ability to identify, assess, analyze, and articulate complex engineering problems.

Graduation Requirements	Secondary Indicator Points
mathematics, natural sciences, engineering, and water supply and drainage science and engineering, and through literature review, identify and analyze complex issues in water supply and drainage science and engineering, propose feasible approaches to obtain effective conclusions.	2.2 By consulting literature databases, standards, regulations, and manuals, comprehensively analyze complex engineering issues in water engineering planning, design, construction, and operation management, propose economical and effective strategies to obtain practical solutions and conclusions.
(3) Design/Development Solutions: Capable of proposing effective and rational design solutions for complex issues in the field of water supply and drainage science and engineering, designing systems, process flows, or process units that meet specific requirements, demonstrating innovation in the design process, and considering the impact of factors such as societal, health, safety, legal, cultural, and environmental aspects.	3.1 Proficient in the analysis and design methods of units or process flows, developing rational solutions based on the specific requirements of water supply and drainage science and engineering, and meeting the specific needs of practical engineering projects.
	3.2 Considering the impact of societal, health, safety, legal, cultural, and environmental factors on solutions, and demonstrating a certain level of innovation in the design process.
(4) Research: Ability to conduct research on complex engineering problems in civil engineering based on scientific principles and using scientific methods, including designing experiments, analyzing and interpreting data, and deriving reasonable and effective conclusions through information synthesis.	4.1 Proficient in utilizing the fundamental principles of natural science and engineering, mastering methods and skills for engineering basic experimental design, testing, and detection, designing experiments based on engineering problems, selecting appropriate research platforms, correctly applying analytical testing and detection methods, conducting scientific experiments accurately, and collecting, analyzing, and interpreting experimental data correctly.
	4.2 When addressing complex water supply and drainage engineering issues, able to comprehensively analyze data using the fundamental principles of water supply and drainage science and scientific methods to arrive at valid conclusions.
(5) Utilization of Modern Tools: Capable of developing, selecting, and utilizing	5.1 Mastery of the usage methods of modern engineering tools, information technology tools, engineering technologies, and resources, and the ability to make rational selections of modern tools based on complex engineering problems. Proficiency in the

Graduation Requirements	Secondary Indicator Points
appropriate technologies, resources, modern engineering tools, and information technology tools for addressing complex issues in water supply and drainage science and engineering. Proficient in applying mathematical, engineering, and management models and methods for the simulation, analysis, prediction, and optimization of complex engineering problems, while understanding their limitations..	fundamental methods of engineering technology and modern engineering tool development.
	5.2 Ability to apply technical, engineering, economic, and management models and methods for the development, selection, and utilization of modern tools in simulation, analysis, prediction, and optimization to address complex engineering problems. Capable of understanding the limitations associated with these tools.
(6) Engineering and Society: Capable of conducting rational analysis and evaluation, based on the background knowledge of water supply and drainage science and engineering, of the impact of professional engineering practices and solutions to complex engineering problems on society, health, safety, law, and culture, and understanding the responsibilities that need to be assumed.	6.1 Able to utilize knowledge of water engineering-related laws and regulations, industry policies, technical standards systems, etc., to rationally analyze and evaluate the impact of solutions to complex water supply and drainage engineering problems on society, health, safety, law, and culture.
	6.2 Capable of understanding the responsibilities that needed to be assumed throughout the entire process of implementing engineering solutions. Environment and Sustainable Development:
(7) Environment and Sustainable Development: Possessing an awareness of harmonious development between humans and nature, environmental protection knowledge, and adhering to the concept of social sustainable development. Capable of understanding and evaluating the impact of engineering practices in solving complex engineering problems on social, environmental, and economic sustainable development.	7.1 Understanding the essence and significance of the environment and sustainable development, and being able to evaluate the impact of water engineering practices on the environment and nature.
	7.2 Using professional knowledge to analyze and evaluate the impact of water engineering practices on social, environmental, and economic sustainable development.
(8) Professional Ethics: Upholding the core socialist values, possessing humanistic and social science literacy, and a sense of social responsibility. Being able to understand and	8.1 Practicing the core socialist values, possessing humanistic literacy and legal awareness, and consciously complying with them in water engineering practice
	8.2 Understanding the engineer's responsibility for the safety, health, welfare of the public, and environmental protection, and

Graduation Requirements	Secondary Indicator Points
adhere to professional ethical norms and engineering ethical principles in engineering practice within the profession, and fulfill responsibilities.	being able to adhere to professional ethical norms and engineering ethical principles, and conscientiously fulfill responsibilities.
(9) Individual and Team: Being able to take on roles as an individual, team member, and leader in a multidisciplinary team, possessing strong collaborative spirit and some organizational management skills.	9.1 Understanding the inherent connections among various disciplines in the field of water engineering, having team awareness and collaborative spirit, and correctly understanding one's role and responsibilities within the team.
	9.2 Having a sense of responsibility as a leader and organizational management skills in a multidisciplinary team.
(10) Communication: Being able to effectively communicate and interact with industry peers and the general public on complex issues in the field of water science and engineering, including writing reports and design documents, creating drawings, making presentations, and responding to instructions. Having proficiency in a foreign language, possessing listening, speaking, reading, and writing abilities, and having an international perspective to communicate and interact in a cross-cultural context.	10.1 Addressing complex issues in water science and engineering through design drawings, design documents, research reports, presentations, etc., for professional communication. Being able to correctly understand the relationship between water science and engineering and various disciplines, while providing clear and accurate responses to queries from industry peers and the general public.
	10.2 Mastering a foreign language, understanding international trends and research advancements in urban and rural water engineering fields. Being able to comprehend and respect the impact of different cultural backgrounds on engineering practices and effectively communicate and interact in a cross-cultural context.
(11) Project Management: Understanding and mastering the principles of water engineering project management and economic decision-making methods, and being able to apply them in a multidisciplinary environment. Possessing a certain level of organizational and management skills.	11.1 Mastering the principles and methods of engineering management, operations management, and economic decision-making related to water engineering.
	11.2 Being able to apply the principles and methods of engineering management, operations management, and economic decision-making in water engineering practices within a multidisciplinary context, and having the ability to organize and manage engineering projects effectively.
(12) Continuous Learning: Having a sense of self-directed and lifelong learning, and the ability to continuously learn and adapt to one's own developmental needs.	12.1 Recognizing the importance of self-directed learning and staying updated with new knowledge. Having a sense of self-directed learning, understanding avenues and methods for expanding knowledge and enhancing skills.
	12.2 Possessing the ability for self-directed and lifelong learning, being able to integrate industry developments with personal

Graduation Requirements	Secondary Indicator Points
	developmental needs, and continuously learning and adapting to both societal and personal growth.

The support for graduation requirements and training goals is represented by H (high support), M (medium support), and L (low support), respectively.

Table 10-2 Support Matrix for Graduation Requirements and Training Objectives

	Training Objective 1	Training Objective 2	Training Objective 3	Training Objective 4	Training Objective 5	Training Objective 6
Graduation Requirement 1.1		H				
Graduation Requirement 1.2		H				
Graduation Requirement 1.3			H			
Graduation Requirement 1.4				H		
Graduation Requirement 2.1		H				
Graduation Requirement 2.2					H	
Graduation Requirement 3.1					H	
Graduation Requirement 3.2	H					
Graduation Requirement 4.1				H		

	Training Objective 1	Training Objective 2	Training Objective 3	Training Objective 4	Training Objective 5	Training Objective 6
Graduation Requirement 4.2				H		
Graduation Requirement 5.1			H			
Graduation Requirement 5.2					H	
Graduation Requirement 6.1			H			
Graduation Requirement 6.2	M					
Graduation Requirement 7.1				M		
Graduation Requirement 7.2					M	
Graduation Requirement 8.1	H					
Graduation Requirement 8.2	H					
Graduation Requirement 9.1	H					
Graduation Requirement 9.2	H					
Graduation Requirement 10.1				H		

	Training Objective 1	Training Objective 2	Training Objective 3	Training Objective 4	Training Objective 5	Training Objective 6
Graduation Requirement 10.2				M		
Graduation Requirement 11.1				H		
Graduation Requirement 11.2					H	
Graduation Requirement 12.1						H
Graduation Requirement 12.2						H

Table 10-2 Support Matrix for Graduation Requirements and Learning Outcomes

	Learning Outcomes 1	Learning Outcomes 2	Learning Outcomes 3	Learning Outcomes 4	Learning Outcomes 5	Learning Outcomes 6
Graduation Requirement 1	H					
Graduation Requirement 2		H	M			
Graduation Requirement 3				H		
Graduation Requirement 4				H		
Graduation Requirement 5			H			
Graduation Requirement 6		M				H
Graduation Requirement 7						H

	Learning Outcomes 1	Learning Outcomes 2	Learning Outcomes 3	Learning Outcomes 4	Learning Outcomes 5	Learning Outcomes 6
Graduation Requirement 8						H
Graduation Requirement 9					H	
Graduation Requirement 10					H	
Graduation Requirement 11	M					H
Graduation Requirement 12	M	H				