

水文与水资源工程专业本科培养方案

Undergraduate Program for Hydrology and Water Resources Engineering

Educational Objectives

5

1

2

3

4

This major is designed to cultivate 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:

Goal 1 (knowledge capability): 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.

Goal 2 (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.

Goal 3 (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.

Goal 4 (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.

Cultivation Standards

I

Length of Schooling

4

Duration: 4 years

II

Degree

Degrees conferred: Bachelor of Engineering

III

Basic requirements for Cultivation

1.

2.

3. /

4.

5.

6.

7.

8.

9.

10.

11.

12.

Students in this major study basic knowledge and basic theories in mathematics, natural sciences, hydrology and water resources, water ecological environment, etc., and are trained in engineering surveying, scientific calculations, experiments and tests, and can use basic theories and basic skills to analyze and solve practical problems in this profession and related fields, and have basic ability to engage in scientific research and management in this field and related fields.

Graduates should acquire the following knowledge, abilities and qualities:

1. Engineering knowledge: Apply knowledge of mathematics, science, hydrology, water resources, water environment and hydroecology to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, research literature and analyse complex engineering problems concerned with hydrology, water resources, water environment and hydroecology, reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design / Develop solutions: Design solutions for complex engineering problems concerned

with hydrology, water resources, water environment and hydroecology and design systems, components or processes that meet specified needs and be able to embody innovative awareness with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

4. Research: Conduct investigations of complex problems concerned with hydrology, water resources, water environment and hydroecology using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

5. Apply modern tools: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities concerned with hydrology, water resources, water environment and hydroecology.

6. Engineering and societal: Familiar with national and local policies and laws and regulations, and apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

7. Environment and sustainable development: Understand and evaluate the impact of engineering practice solving complex engineering problems in hydrology and water resources in environmental and societal sustainable development.

8. Professional standards: Have humanity and social science literacy and social responsibility, being able to understand and abide by professional ethics and standards responsibly in engineering practice.

9. Individual and teams: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

10. Communication: Communicate effectively on complex engineering activities concerned with hydrology, water resources, water environment and hydroecology with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions, and communicate in cross-cultural contexts with international perspective.

11. Project management: Demonstrate knowledge and understanding of engineering and management principles and apply these in multidisciplinary environments.

12. Life-long learning 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.

[illegible]

	1	2	3	4	5	6	7	8	9	10	11	12
	H	H										
				H								
	H											
	M											
	H											
				H								
	H	M										
&	H				L							
	M											

(C)

H

[illegible]

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

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	

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
Experiments of Groundwater Contamination and Protection	Project
Design for Hydrometry	Project Design for Hydrological Forecasting
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	Cognition Practice
Engineering Training	
Production (or Graduation) Practice	Graduation Project (Thesis)

Hours/Credits

Table of Hours and Credits

Courses Classified			/ Period/Weeks	Credits		Proportion of Credits
				Theory	Practice	
General Courses Platform	General Compulsory		730	28	11	22.7%
	General Elective		192	12	0	7.0%
Basic Courses Platform	Compulsory		1008	46.5	5.5	30.2%
	Elective		0	0	0	0.0%
Major Courses Platform	Compulsory		688	29	5	19.8%
	Elective		112	6	0.5	3.8%
Practical Teaching Platform	Compulsory		23.5W	0	23.5	13.7%
	Elective		0	0	0	
InnovationandEntre preneurshipPlatform	Innovation Credits			3		2.9%
	Entrepreneurship Credits			2		
Amount	Compulsory Credits	153.5	Elective Credits	18.5	Proportion ofElectiveCredits	10.8%
	Theory Credits	121.5	Practice Credits	50.5	Proportion of Internship andPractical Training	29.4%
The Lowest Graduate Credits			172			

Credits for Each Term

Creditsfor Each Term Courses Classified		Term							
		1st	2nd	3rd	4th	5th	6th	7th	8th
General Courses Platform	General Compulsory	10.5	10	6	6	5	1	0.5	
	General Elective suggestive		2	2	2	2	2	2	
Basic Courses Platform	Compulsory	14	12.5	17	8.5				
	Elective								
Major Courses Platform	Compulsory				8.5	12	13.5		
	Elective					2	1.5	3	
Practical Teaching Platform	Compulsory		0.5		2	3	3	3	12
	Elective								
Amount		24.5	25	25	27	24	21	8.5	12
InnovationandEntrepreneurshipPlatform	Innovation Credits	3							
	Entrepreneurship Credits	2							
The Lowest Graduate Credits		172							

/ Teaching Schedule Form

/ Form : General Course Platform

**A /Form I (A):General Compulsory Courses(General
Required)**

Course Code	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
				The.	Exp.	Pra.	Ueb		
109100000418	Military Theory	2	36	36				1	1-18
109110000318	Military Skill Training	2	36			36		1	1-2
109100000818	National Security Education	1	16	16				1	1
20W100000613	1 English 1	2	32	32				1	4-11
218110000313	1 Physical Education 1	0/1	26			26		1	4-15
209100031018	Computer Base	1/0.5	32	16	16			1	
217100012418	Ideological and moral cultivation and legal basis	2.5/0.5	52	40		12		2	1-14
217100000413	Situation and Policy	2	32	16		16		2	1-16
225100000118	Education of Chinese Minzu Community Consciousness	1.5/ 0.5	36	24		12		2	1-8
20W100000713	2 English 2	2	32	32				2	1-8/ 9-16
218110000213	2 Physical Education 2	0/1	32			32		2	1-16
2171000122	Essentials of China Modern and Contemporary History	2.5/ 0.5	52	40		12		3	1-14
20W100000813	3 English 3	2	32	32				3	1-8/ 9-16
218110000413	3 Physical Education 3	0/1	32			32		3	1-16
112110010718	Labor Education	0/1	32			32		1	1-16

217100012318	Basis Principles of Maxism	2.5/0.5	52	40		12		4	1-14
2171000121	Introduction to MAO Zedong Thought and Socialist Theoretical System with Chinese Characteristics	4/1	88	64		24		5	1-16
20W100000913	4 English 4	2	32	32				4	1-8/ 9-16
218110000113	4 Physical Education 4	0/1	32			32		4	1-16
21811001271		0/0.5	16			16		7	1-16
115100000113	Employment Guidance	1	16	16				6	1-8/ 9-16
: 39 Demand of Credits:Credits: 39									

20W100000813 3 20W100000913 4③20W100001018

④20W100001118 ⑤20W100001218

⑥20W100001318 3,4 4

B /Form I (B): General Elective Courses

Course Classified	Crs.
General Elective Courses	12

Form II. Basic Course Platform

Course Classified	Courses Code	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Basic Courses Required	2241000066	Introduction to Ethnic Resources and Environmental Protection	1.5	24	24				1	
	213100035618	B Z Inorganic Chemistry (B) Z	3	48	48				1	
	213110035818	C Inorganic Chemistry Experiments (C)	0.5	16		16			1	
	213103005213	B Analytical Chemistry (B)	2	32	32				1	
	213110036418	B Analytical Chemistry Experiments (B)	1	32		32			1	
	2101000113	A(1) Higher Mathematics A (1)	4	80	64			16	1	
	2101000118	Linear Algebra	2	48	32			16	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	B(1) University Physics B(1) Experiments	0.5	16		16			2	
	2241000067	Engineering Surveying	2	32	32				2	
	224100000913	& Descriptive Geometry & Engineering Drawing	2	32	32				2	

Course Classified	Courses Code	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Basic Courses Required	2101000112	Probability Theory and Mathematical Statistics	2.5	56	40			16	3	
	211100011218	B(2) College Physics B (2)	2	40	32			8	3	
	211112000213	B(2) University Physics B(2) Experiments	0.5	16		16			3	
	209100031218	C II Programming Language (C) II	2/1	64	32	32			3	
	210100012618	C Operations Research (C)	1.5	24	24				3	
	224100003313	Physical Geography	2	36	32	4			3	
	224100016718	Meteorology	2	36	32	4			3	
	213103015513	An Introduction to Water Conservancy Engineering	2	32	32				3	
	224100018518	CAD Water Conservancy Engineering CAD	0.5/1	40	8	32			3	
	209100031518	Matlab Programming Language (Matlab)	1/0.5	32	16	16			4	
	213103015913	Hydraulics	4	64	64				4	
	213113015113	Hydraulics Experiments	0.5	16		16			4	
	213103013213	Engineering Mechanics	2.5	40	40				4	
: 52					52	0				
Demand of Credits: Credits: 52 Required: 52 Elective: 0										

Form III: Major Courses Platform

Course Classified	CourseCode	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Required Courses	213103014913	Principles of Hydrology	4	64	64				4	
	224110020518	Experiments for Principles of Hydrology	0.5	16		16			4	
	224100020118	Hydrological Statistics	1.5	24	24				4	
	224100017018	Hydrometry	2	32	32				4	
	224110017118	Hydrometry Experiments	0.5	16		16			4	
	224100016818	Water Environmental Monitoring	1	16	16				5	
	224110016918	Experiments of Water Environmental Monitoring	0.5	16		16			5	
	2241000120	Hydrological Forecasting	3	48	48				5	
	2241100121	Experiments of Hydrological Forecasting	0.5	16		16			5	
	2241000113	Hydrological Analysis and Computation	2	32	32				5	
	224100017218	Groundwater Hydrology	2.5	40	40				5	
	213103017013	River Dynamics	2	32	32				5	
	2241100118	Experiments of Water Dynamics	0.5	16		16			5	
	213103016413	Aqueous Environmental Chemistry	2	32	32				6	

Course Classified	CourseCode	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Required Courses	213113019013	Experiments of Aqueous Environmental Chemistry	0.5	16		16			6	
	2241000114	Water Conservancy Computation	2	32	32				6	
	213103032313	Water Resources Utilization	2	32	32				6	
	213103017313	Protection of Water Environment	2	32	32				6	

Course Classified	CourseCode	Course Names	Crs.	Hrs.	Period Classified				Semester	Notes
					The.	Exp.	Pra.	Ueb		
Elective courses	2241000078	Literature Retrieval and Scientific Paper Writing	1/0.5	32	16	16			7	
	213103021413	Ecological Hydrology	1.5	24	24				7	
	213103017413	Water-related Disaster Prevention and Control	1.5	24	24				7	
: 40.5										

Form IV: Practical Teaching Platform

Course Classified		Course Code	Course Names	Crs.	Total Period	Period Classified		Semester	Place
						Exp.	Pra.		
Teaching Practice	Project Design	213113031413	Project Design for Hydrometry	1	1W			4	
		2241100129	Project Design for Hydrological Forecasting	1	1W			5	
		2241100115	Project Design for Hydrological Analysis and Computation	1	1W			5	
		2241100116	Project Design for Water Conservancy Computation	1	1W			6	
		213113029513	Project Design for Water Resources Utilization	1	1W			6	
		224110000813	Project Design for Protection of Water Environment	1	1W			6	
	Amount			6	6W				
Teaching Exercitation	Teaching Exercitation	2241100080	Engineering Surveying Practice	0.5	0.5W		√	2	At School
		224110006213	Cognition Practice	1	1W		√	4	Out of School
		70111000011	A Engineering Training	1	1W		√	5	Out of School
	Graduation Practice	224110000313	Production (or Graduation) Practice	3	3W		√	7	Out of School
	Graduation Thesis (Project)	224110017618	Graduation Project (Thesis)	12	12W			8	At School

Course Classified		Course Code	Course Names	Crs.	Total Period	Period Classified		Semester	Place
						Exp.	Pra.		
	Amount			17.5	17.5W				
Amount			Credits 23.5		Period 23.5W	Weeks 23.5			

Form V: Innovation &Entrepreneurship Platform

CourseClassified		Crs.
Innovation Credits		3
Entrepreneurship Credits		2
Amount	5	