

Attachment B-12: All course outlines for the Water Supply and Drainage major



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Appendix B-1: Syllabus for all courses in the Water Supply and Drainage Major

Syllabus of Ideological and Moral Cultivation and Legal Foundation

Course name	Ideological and moral cultivation and legal basis	Course number	9123311031							
English name	Reflections on the Moral and Legal Basis									
Applicable majors	Water Supply and Drainage Science and Engineering									
Nature of the course	General education courses <input checked="" type="checkbox"/> <input type="checkbox"/> basic courses <input type="checkbox"/> major core courses (elective compulsory), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>									
Offering unit	School of Marxism									
Total credit hours	48	Credits	3.0	Theoretical hours	40	Practical hours	8	Computer-based hours	0	
Prerequisites	not									
Teaching materials and reference materials	"Ideological and Moral Cultivation and Legal Foundation" textbook compilation research group, published by Higher Education Press									

1. Course Introduction

Thinking of Ethics and Legal Basis This course aims at the ideological, moral and legal problems faced by college students in the process of growing up, carries out the education of Marxist world view, outlook on life, values, morality and legal outlook, and guides college students to improve their ideological and moral quality and legal literacy. Grow into a newcomer of the era who consciously takes on the great task of national rejuvenation.

2. Teaching objectives and teaching methods of this course

(1) Course teaching objectives

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Teaching Objective 1: Through theoretical teaching, educate college students to take Marxism as the guiding ideology, cultivate and practice the core values of socialism, and become new people of the era with ideals, skills and responsibilities.

Course Teaching Objective 2: Have a good humanities and social sciences literacy and a strong sense of social responsibility, and be able to understand and abide by engineering professional ethics and norms in engineering practice in this field.

Course Teaching Objective 3: In the practical teaching, the core values of socialism of college students are cultivated, and the core values of socialism are practiced in the form of micro-photo display activities of the "five micro" practical teaching mode of our school and research learning competitions for college students in the province.

(2) Teaching methods

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1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is assigned corresponding exercises, including reflection questions and quiz questions, to deepen understanding and grasp the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Chu Jing Department (Office) Director Review: Chu Jing College Leader Review: He Junxin

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Syllabus of the Outline of Modern Chinese History

Course name	Outline of Modern Chinese History	Course number	9124311041						
English name	An overview of modern and contemporary Chinese history								
Applicable majors	All undergraduate majors in the university								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Marxism								
Total credit hours	48	Credits	3,0	Theoretical hours	40	Practical hours	8	Computer-based hours	0
Prerequisites	Ideology, Morality and Legal Basis								
Teaching materials and reference materials	Course textbook: Outline of Modern Chinese History, Higher Education Press, 2018 edition References: Selected Works of Marx and Engels, Selected Works of Mao Zedong, Modern Chinese Historical Documents, Related Textbooks, etc								

1、 Course Description:

The Outline of Modern and Contemporary History of China (hereinafter referred to as the "Outline of Modern and Contemporary History of China") is one of the compulsory ideological and political theory courses for undergraduates in colleges and universities across the country.

Course Description:

"Introduction to Modern Chinese History" is an ideological and political theory course, which is required for undergraduates in colleges and universities. As an open basic course, the Outline of Modern Chinese History teaches modern Chinese history, including resisting foreign aggression, striving for national independence, realizing the liberation of the people, the prosperity of the country and the prosperity of the people. This course attempts to achieve the effect of ideological and political theory courses from a historical perspective.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

(1) Course teaching objectives

Through the theoretical and practical teaching of this course, students will be equipped with the following qualities and abilities:

Course Objective 1: To understand the course and lessons learned from the arduous exploration and tenacious struggle of the Chinese people against foreign aggression and for national independence and liberation in

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modern times, and to understand the overall appearance and basic clues of history; Understand the historical process of the Chinese people seeking prosperity and strength, liberating and developing productive forces, and moving toward modernization in modern times; Understand the history of modern times and the historical inevitability of the people's choice of Marxism, the Communist Party of China, the socialist road, and reform and opening up.

Course Objective 2: "Taking History as a Mirror", cultivating students' ability to use the standpoints, viewpoints and methods of dialectical materialism and historical materialism to learn and study modern Chinese history, and to discover, analyze and solve problems; Cultivate students' ability to think rationally about the real society, discern the direction of social development and comprehensive analysis.

Course Objective 3: To educate students to inherit and carry forward the tradition of patriotism and revolution, to carry forward the national spirit with patriotism as the core and the spirit of the times with reform and innovation as the core, and to enhance national self-esteem, self-confidence, pride and a sense of historical responsibility to devote themselves to the realization of the "Chinese Dream" of the great rejuvenation of the Chinese nation.

Course Objective 4: To enhance students' belief and confidence in adhering to the leadership of the Communist Party of China, guided by Marxism, and unswervingly following the path of socialism with Chinese characteristics through reform and opening up.

(2) Teaching methods

1. Theoretical teaching

To study this course well, it is necessary to study the important scientific works of Comrade Mao Zedong and other leaders, and combine the party's important documents with reading textbooks; Combining the study of theory with the understanding of history; Classroom lectures are combined with student practice. Therefore, this course requires teachers to have a deep theoretical foundation, the ability to continue learning, and flexible and diverse teaching methods for students with different professional backgrounds, so as to calmly control the classroom.

In addition, the application of multimedia modern teaching technology is also indispensable, because as a public class, it is often taught in large classes, with many people and large classrooms. The second reason is that it is necessary to "use history to lead the theory" and need a large amount of historical materials for guidance. Therefore, the use of multimedia technology in teaching can make full use of the amount of information, broaden the horizon, and make full use of learning resources.

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2. After-class exercises

Corresponding exercises are assigned for each topic, including thinking questions and question and answer questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

According to the teaching content, group discussions, reading sharing, etc., are arranged to fully mobilize students' interest in active learning.

Formulated by: Liu Hengshan, Director of the Department (Office) Review: Liu Hengshan College Leader Review: He Junxin

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Syllabus of the Basic Principles of Marxism

Course name	Basic Principles of Marxism	Course number	9121311011						
English name	The basic principles of Marxism								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Marxism								
Total credit hours	48	Credits	3.0	Theoretical hours	40	Practical hours	8	Computer-based hours	0
Prerequisites	Ideological and moral cultivation and legal basis, outline of modern Chinese history, etc								
Teaching materials and reference materials	Course textbook: Introduction to the Basic Principles of Marxism, Higher Education Press (2018). References: Selected Works of Marx and Engels, Xi Jinping on Governance, related textbooks, etc.								

1、 Course Description:

"Basic Principles of Marxism" (hereinafter referred to as "Principles") is a compulsory public course for undergraduates in colleges and universities. The goal and task of the course is to help college students understand the origin of the world from the perspective of ontology, and correctly understand the basic theories of materialism and dialectics. From the perspective of epistemology, we should understand the line of dialectical materialism, and correctly understand the principle of truth and the principle of value and the highest state of their unity—truth, goodness, and beauty; From the perspective of social history or historical philosophy, we should understand the laws of human historical development, especially the basic laws of capitalist and socialist economic operations, correctly understand the future trend of economic globalization and the development of human society, and establish a firm belief in socialism with Chinese characteristics.

2、 Teaching objectives and methods of the course

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be familiar with Marxist positions, viewpoints and methods, to be able to apply the basic principles of Marxism, to analyze social and historical phenomena, and to establish a sense of social responsibility.

Course Objective 2: To be familiar with the Marxist view of nature, to be able to clearly understand that man is a product of nature, that man is developed in and with nature, and to establish the concept of harmony between man and nature.

Course Objective 3: To be familiar with historical materialism, to be able to understand the unity of the individual and the society, to focus on understanding and grasping the role of a certain group and individual from a certain social relationship, to play the main role, and to cultivate a sense of teamwork.

Course Objective 4: To correctly and rationally look at the new situations and new problems that have emerged in the current capitalist society, strengthen the ideals and beliefs of building socialism with Chinese characteristics, adhere to the road of socialism with Chinese characteristics, and consciously establish the lofty ideals of communism.

(2) Teaching methods

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This course is a theoretical course, the teaching process mainly uses the basic principles and methods of Marxist dialectical materialism and historical materialism, the use of multimedia classroom teaching, the use of special lectures, problem discussions, case introduction, etc., and at the same time with after-school homework, micro story practice activities, etc., to carry out systematic Marxist theory education for students, help students master the Marxist world view and methodology, and establish Marxist outlook on life and values. It is necessary to train students' ability to observe and analyze problems with the Marxist world outlook and methodology, to cultivate and improve their ability to use Marxist theory to analyze and solve practical problems, and to lay a solid theoretical foundation for students to establish their ideals and beliefs in building socialism with Chinese characteristics and to consciously adhere to the party's basic theory, basic line, and basic program.

The following methods are used in teaching:

1. Thematic teaching method. Based on the principle of value-oriented and problem-oriented, the content of the textbook is summarized and designed into 9 topics.
2. Case introduction method. This course is very rich in theory, and some of the content is very abstract and difficult to understand, and the introduction of cases can effectively mobilize students' interest and enthusiasm in learning.
3. Problem discussion method. The title of the topic is in the form of a question, and the teaching process will also be spread out according to the case or current affairs hot topic, and will be discussed inside and outside the class. This course has an online platform, which can be discussed and tracked online and offline to consolidate and digest the knowledge learned.

Formulated by: Deng Fengxiang Department (Office) Director Review: Deng Fengxiang College Leader Review:
He Junxin

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Syllabus of Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics

Course name	Mao Zedong Thought and the theoretical system of socialism with Chinese characteristics	Course number	9122311021						
English name	Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics								
Applicable majors	All undergraduate majors in the university								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Marxism								
Total credit hours	80	Credits	5,0	Theoretical hours	72	Practical hours	8	Computer-based hours	0
Prerequisites	Ideological Character and Legal Foundation, Marxist Philosophical Principles, Outline of Modern Chinese History								
Teaching materials and reference materials	Course textbook: Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics, Higher Education Press (2018). References: Selected Writings of Leaders, Party History Literature, Related Teaching Materials, etc								

1、 Course Description:

Mao Zedong Thought and Introduction to theoretical system of socialism with Chinese characteristics It is a general course of ideological and political theory for all undergraduate majors in the university, which takes the theoretical achievements formed in the process of Sinicization of Marxism and the basic theories, basic lines, and basic strategies for upholding and developing socialism with Chinese characteristics in the new era as the research object. The main content, spiritual essence, historical status and guiding significance of the theoretical achievements of the Sinicization of Marxism fully reflect the historical process and basic experience of the Communist Party of China in continuously promoting the integration of the basic tenets of Marxism with China's specific reality. In the new era, upholding and developing the basic theories, basic lines and basic strategies of socialism with Chinese characteristics fully reflect the theoretical guidance and strategic deployment for building a great modern socialist country. The main task of this course is to help students systematically master the theoretical knowledge of Chinese Marxism and enhance their self-confidence in the path of socialism with Chinese characteristics, theoretical self-confidence, institutional self-confidence and cultural self-confidence.

2、 Teaching objectives and methods of the course

1. Teaching objectives of the course

Through the theoretical and practical teaching of this course, it helps students systematically master the theoretical knowledge of Chinese Marxism, and enhance their self-confidence in the path of socialism with Chinese characteristics, theoretical self-confidence, institutional self-confidence and cultural self-confidence

Course Objective 1: To have an accurate grasp of the theoretical achievements formed in the process of Sinicization of Marxism;

Course Objective 2: To have a deep understanding of the historical process, historical transformation, and historical achievements of the revolution, construction, and reform carried out by the people under the leadership of the Communist Party of China;

Course Objective 3: To have a thorough understanding of the basic theories, basic lines and basic strategies adhered to by the Communist Party of China in the new era;

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Course Objective 4: To enhance the ability to understand, analyze and solve problems using Marxist standpoints, viewpoints and methods;

Course Objective 5: Enhance recognition of the major principles and policies of the Party and the state, and strengthen self-confidence in the path of socialism with Chinese characteristics, theoretical self-confidence, institutional self-confidence and cultural self-confidence.

(2) Teaching methods

1. Theoretical teaching

(1) Classroom teaching

Classroom lectures are the mainstay, supplemented by appropriate discussions to enhance the learning effect.

(2) After-class exercises

Each chapter is assigned corresponding exercises, including reflection questions and quiz questions, to deepen understanding and grasp the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

(3) Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

2. Hands-on teaching

(1) Teaching form: "Micro video" display competition of the "five micro" practical teaching mode of the ideological and political theory course of Hunan City University.

(2) Activity time: during the course teaching period (divided into preliminary round, semi-final and final round).

(3) Theme of the activity: Cultivating and practicing the core values of socialism (patriotism, dedication, integrity, and friendliness) is the theme of the work.

(4) Work requirements: Students in the natural class of 8-10 people in a group, the duration of the work is 3-5 minutes, the work is required to be close to the theme, the work is innovative, artistic and technical.

(5) Competition arrangement: 1-2 weeks of teachers to guide students to group works, determine the topic, before the 6th week Friday by the class study committee to assist the teacher to collect the works; In the 7th week, the preliminary round will be held in each classroom, and one group of best works will be selected for the semi-finals by each natural class. Starting from the 8th week, the shortlisted works of the semi-finals will be uploaded to the theme learning website, and all students of the introduction course will be accepted. On this basis, 16 groups were selected to be shortlisted for the finals by expert review, and in the 12th week, 100 public judges voted and 5 judges scored at the exhibition competition site to comprehensively determine the final rankings, and were rewarded in the form of bonuses and honorary certificates.

Formulated by: Wang Yanghua, Director of the Department (Office) Review: Huang Huilian College Leaders

Review: He Jun's New

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Situation and Policy Syllabus

Course name	Situation and policy				Course number	9125111050			
English name	Situation and policy								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> <input type="checkbox"/> basic courses <input type="checkbox"/> major core courses (elective compulsory), self-development courses (compulsory <input type="checkbox"/> electives <input checked="" type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Marxism								
Total credit hours	32	Credits	2,0	Theoretical hours	32	Practical hours	0	Computer-based hours	0
Prerequisites	not								
Teaching materials and reference materials	Course textbook: Published by Xinhua Publishing House, the writing team of "College Students' Situation and Policy Course". Reference: "Situation and Policy" Special Speech, Current Affairs Report Magazine of the Propaganda Department of the Central Committee								

1. Course Introduction

The course "Situation and Policy" is an important part of the ideological and political theory course in colleges and universities, and is the main channel and main position for students to educate students on the situation and policy, and is a compulsory course for every college student. Guided by Marxism-Leninism, Mao Zedong Thought, and the theoretical system of socialism with Chinese characteristics, based on the training objectives of colleges and universities, closely integrated with the domestic and international situations, and firmly grasping the ideological reality of college students, it conducts ideological and political education courses for college students on the party's line, principles, and policies. Teachers mainly teach in the classroom, supplemented by practical teaching, and improve the timeliness of teaching through teaching methods and means such as special lectures, multimedia audio and video.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Teaching Objective 1: In order to comprehensively and thoroughly study and implement the spirit of the 19th National Congress of the Communist Party of China, help college students understand and master the international and domestic situation and national guidelines and policies, broaden their horizons, and improve their ideological and theoretical literacy and policy level.

Teaching Objective 2: To guide college students to unify their thinking, gather strength, unswervingly follow the path of socialism with Chinese characteristics, and study hard for the "Chinese Dream" of building a moderately prosperous society in an all-round way and the great rejuvenation of the Chinese nation.

Teaching Objective 3: Be familiar with the basic positions, viewpoints and methods of Marxism, be able to

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apply the basic principles of Marxism, analyze social and historical phenomena, and establish a sense of social responsibility.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time to broaden learning ideas.

3. News commentary for 10 minutes before class.

Urge students to develop the habit of paying attention to current affairs and improve their ability to analyze and solve problems.

Formulated by: Yao Yanxia, Director of the Department (Office) Review: Yao Yanxia College Leader Review: He Junxin

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College English (1) Syllabus

Course name	College English(1)	Course number	9054311011						
English name	College English (1).								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> <input type="checkbox"/> basic courses <input type="checkbox"/> major core courses (elective compulsory <input type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/> , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Humanities/University English Department								
Total credit hours	48	Credits	3.0	Theoretical hours	48	Practical hours	0	Computer-based hours	0
Prerequisites	High School English								
Teaching materials and Teaching resources	Course textbook: New Target College English Comprehensive Course 1 (student's book), Editor-in-Chief: Shu Dingfang, Editor-in-Chief: Liu Zhengguang, Peng Peilu, Shanghai Foreign Language Education Press, April 2017. New Vision University English Reading and Writing Course 1 (3rd Edition), Editor-in-Chief: Zheng Shutang, Editors-in-Chief: Ding Yaping, Wu Yong, Foreign Language Teaching and Research Press, June 2015. New Vision University English Listening and Speaking Course 1 (3rd Edition), Editor-in-Chief: Zheng Shutang, Editor-in-Chief: Ding Yaping, Foreign Language Teaching and Research Press, July 2017. References: Tutorial materials for various CET-4 exams.								

1. Course Introduction

College English (1) is a compulsory general education course for non-English majors, which is a teaching system that integrates a variety of teaching modes and teaching methods with basic language knowledge, basic language skills, language learning strategies and cross-cultural communication as the main content, advanced foreign language teaching theories as the guide, high-quality educational resources, and a variety of teaching modes and teaching methods. The teaching objectives of this course are to cultivate students' comprehensive English application ability, enhance students' awareness and ability of cross-cultural communication, cultivate students' independent language learning ability, improve students' comprehensive cultural literacy, and make students become compound talents who meet the needs of socialist economic development with Chinese characteristics and international cultural and technological exchanges in the new era.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching of this course, students will be equipped with basic English language knowledge and application skills. The specific course objectives are as follows:

课程目标 1: Able to understand oral expressions with a normal speed (about 100~140 words/minute)

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related to personal interests, such as speeches, non-professional lectures, news reports, etc. Distinguish between primary and secondary information based on discourse characteristics and understand the main content. Able to understand conversations on familiar topics and understand the views and intentions of the speakers.

课程目标 2: Able to read simple language and different types of materials, such as short stories, letters, etc., extract detailed information and summarize the main idea. Able to read narrative and argumentative essays in simple language and on a wide range of topics, distinguish between facts and opinions, and make simple inferences. Able to understand complex language materials and understand the relationship between meanings by analyzing sentence and text structures. The reading speed reaches 70-100 words per minute.

课程目标 3: Able to verbally express personal needs and wishes, and choose appropriate expressions according to the person with whom they are communicating, such as the degree of politeness. Able to communicate on topics of interest and respond in a timely manner to ensure smooth communication. Ability to tell short stories or personal experiences in an organized manner. Able to briefly introduce or explain common activities or scenes in daily life and work, such as sports, leisure and entertainment, scenic spots, etc.

课程目标 4: Able to express their opinions in writing on familiar topics, and use certain evidence to support their opinions, with strong persuasive power. Able to describe personal experiences and activities around them, such as campus activities, using common rhetorical devices, fluent sentences, and complete narratives. Able to discuss social and cultural content, such as traditional festivals, customs, etc., through social media, such as emails, web pages, etc. Ability to communicate effectively and work in a team.

课程目标 5: Able to use grammatical knowledge such as sentence structure, tense and voice to understand information accurately. Able to use appropriate vocabulary to describe things, define concepts, etc., and speak in an appropriate tone and intonation. Ability to organize information effectively using basic discourse knowledge for communicative purposes.

课程目标 6: Able to understand the intentions expressed by the other person in general social interactions. Able to communicate with others on familiar topics, use appropriate language forms and communication strategies according to specific communication situations, politely and tactfully express a wide range of intentions such as apologies, complaints, and gratitude, abide by important communication norms, and maintain good interpersonal relationships.

课程目标 7: Able to translate passages in plain language that are familiar with topics or everyday life, and reproduce the main message of the original text. Master about 4,000 words and 700 phrases, including about 2,000

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words of positive vocabulary that can be used proficiently in both oral and written expression. Have the ability to use basic syntactic knowledge, be able to use simple sentences with complete structure, understand and master the basic structure of compound sentences, and be able to use a variety of verb tenses to express themselves.

(2) Teaching methods

1. Equal emphasis on classroom learning and self-directed learning after class

The online and offline hybrid teaching mode is used, with classroom learning as the mainstay, and some of the content is based on self-directed learning after class, and after-class tests and activities are arranged.

2. Exercises

Combined with the teaching units of the textbooks, corresponding exercises are arranged, including content covering all teaching objectives, to deepen the understanding and mastery of classroom learning content, and to cultivate students' ability to review independently, consolidate classroom knowledge points, and use language flexibly.

3. Testing

Cooperate with classroom teaching and organize tests related to teaching objectives.

4. Mock exams

Organize the CET-4 mock test, study and judge the learning situation of students, and adjust the response measures for the CET-4 test.

Formulated by: Yin Suiqiong, Director of the Department (Office) Review: Liu Pingping, College Leader Review: Zhou Ruiying

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College English (2) Syllabus

Course name	College English(2)	Course number	9054311021						
English name	College English (2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Humanities/University English Department								
Total credit hours	48	Credits	3.0	Theoretical hours	48	Practical hours	0	Computer-based hours	0
Prerequisites	College English(1)								
Teaching materials and reference materials	Course materials: Liu Zhengguang, Ji Jianzhong. New Target College English Comprehensive Course 2. Shanghai: Shanghai Foreign Language Education Press, 2017. Zheng Shutang. New Vision College English Reading and Writing Course 2 (3rd Edition). Beijing: Foreign Language Teaching and Research Press, 2015. Zheng Shutang. New Vision College English Listening and Speaking Course 2 (3rd Edition). Beijing: Foreign Language Teaching and Research Press, 2017. References: CET-4 related materials								

1、 Course Description:

College English (2) is a compulsory general education course for non-English majors. It is a teaching system with basic language knowledge, basic language skills, language learning strategies and cross-cultural communication as the main content, guided by advanced foreign language teaching theories, integrating high-quality educational resources, and integrating a variety of teaching modes and teaching methods. The teaching objectives of this course are to improve students' comprehensive English application ability, enhance students' awareness and ability of cross-cultural communication, improve students' independent language learning ability, further improve students' comprehensive cultural literacy, and cultivate students to become compound talents who meet the needs of socialist economic development with Chinese characteristics and international cultural and technological exchanges in the new era.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching of this course, students will be equipped with basic English language knowledge and application skills. The specific course objectives are as follows:

Course Objective 1: To understand the oral expression of normal speech speed (about 120~150 words/minute) and general topics, obtain key points and details, clarify the logical relationships, such as cause and effect, transition, progression, etc., and understand the basic cultural connotation of discourse. Able to understand the main content when listening to and watching radio and television programs on general topics.

Course Objective 2: To understand the main ideas, analyze the characteristics of the language, and comprehend the cultural connotation when reading materials with complex language and rich topics, such as education, science and technology, culture, etc. Able to read discursive materials with complex language, such as social reviews and book reviews, and distinguish between different points of view. The reading speed reaches 100-120 words per minute.

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Course Objective 3: To be able to express oral opinions or communicate with others on daily life topics or familiar social hot issues, and express them clearly, in a hierarchical and organized manner. Be prepared to briefly express your personal opinion on a topic relevant to your major. Able to communicate or negotiate effectively verbally on matters of daily life, such as business, travel, shopping, etc.

Course Objective 4: Be able to write short essays on topics of interest, with arguments and arguments, with a variety of cohesion and semantic coherence. Able to write reports related to their own professional fields, such as reading reports, research reports, etc., with a complete structure. Be able to write common application essays, such as thank you letters, meeting minutes, etc., in the correct format and in line with the language expression. Ability to communicate effectively and work in a team.

Course Objective 5: To be able to use relevant grammar and textual knowledge in daily study or work communication, express themselves clearly, and basically meet the norms and requirements of relevant genres. Ideographic functions that understand and use common tones and intonations. Understand the logical semantic relationships between complex sentences or paragraphs. Be able to use appropriate vocabulary to express opinions and start discussions on familiar topics. Able to choose appropriate sentence structures to express relevant communicative purposes.

Course Objective 6: To understand the opinions, emotions, attitudes, intentions, etc. expressed by the other person in common social situations. Be able to communicate with others on topics of common concern, choose appropriate language forms according to the formality of social situations, appropriately express their opinions, emotions, and attitudes, pay attention to differences in cultural customs, and show due respect for the person they communicate with, so as to achieve effective communication.

Course Objective 7: Be able to translate short, plain texts about everyday life in writing and reproduce the main message of the original text. Able to translate texts that describe spatial orientation and natural environment, and the translation is faithful and accurate. Able to translate common indicative texts, such as logos, activity schedules, etc., with complete information and clear meanings.

Course Objective 8: To master approximately 4,500 words and 1,000 phrases, including about 2,500 words of positive vocabulary that can be used proficiently in both oral and written expression. Able to use a variety of sentence structures, understand and grasp the meaning of long and difficult sentences through analysis of syntactic structure, and be able to use complex verb tenses to express themselves.

(2) Teaching methods

1. Equal emphasis on classroom learning and self-directed learning after class

The online and offline hybrid teaching mode is used, with classroom learning as the mainstay, and some of the content is based on self-directed learning after class, and after-class tests and activities are arranged.

2. Exercises

Combined with the teaching units of the textbooks, corresponding exercises are arranged, including content covering all teaching objectives, to deepen the understanding and mastery of classroom learning content, and to cultivate students' ability to review independently, consolidate classroom knowledge points, and use language flexibly.

3. Testing

Cooperate with classroom teaching and organize tests related to teaching objectives.

4. Mock exams

Organize the CET-4 mock test, study and judge the learning situation of students, and adjust the response measures for the CET-4 test.

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Formulated by: Duan Hui, Director of the Department (Office) Review: Liu Pingping, College Leader Review:
Zhou Ruiying

Attachment B-12: All course outlines for the Water Supply and Drainage major



Syllabus of the University English Enrichment Course (1).

Course name	College English Enrichment Course (1)	Course number	9054311031						
English name	College English Extension 1								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> <input type="checkbox"/> basic courses <input type="checkbox"/> major core courses (elective compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	Faculty of Humanities/University English Language Teaching Department								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	College English (1), College English (2).								
Teaching materials and reference materials	Course Materials: 1. Xinchao University English Speaking Course (Upper and Lower), Xiong Lijun, Editor-in-Chief, The Commercial Press, July 2018; References: 1. Editor-in-Chief of New Century English Speaking Course 1-4: Li Huadong Foreign Language Teaching and Research Press, published in January 2014. 2. College English Speaking, edited by Liu Yuanyuan, Higher Education Press, August 2016. 3. New Wave Spoken English for Special Purposes, edited by Zhang Xihua and Wang Lei, Fudan University Press, August 2012								

1、 Course Description:

The Extended Course of College English 1 is a common basic course for non-English majors. It is also offered to non-English majors who have passed the CET-4 test (except for music and physical beauty majors). This course is based on basic language knowledge, basic oral skills, learning strategies and cross-cultural communication as the main content, guided by foreign language teaching theory, and integrates a variety of teaching modes and teaching methods. Through the study of this course, students should be able to have appropriate conversations about general situations in daily life, be able to speak coherently on general topics in social life, be able to express ideas more accurately, and achieve correct pronunciation, intonation and grammar, and appropriate use of language. At the same time, it helps students understand the cultural background and living customs of major English-speaking countries, enhance their cross-cultural communication skills, improve their comprehensive cultural literacy, and enhance their self-learning ability, so as to meet the needs of China's social development and international exchanges.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will master the following knowledge and have the following abilities:

Course Objective 1: Master basic phonetic knowledge, reading skills and repetition skills, and have good reading ability and certain oral repetition ability.

Course Objective 2: To master the vocabulary and sentence patterns required for daily conversation in a cross-cultural context, and to acquire the language skills required for general academic purposes and the initial sociolinguistic and pragmatic skills.

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Course Objective 3: Master basic presentation skills, impromptu speech on familiar topics, be able to express one's opinions and intentions in English fluently, and have good oral expression skills.

Course Objective 4: To master the basic knowledge of British and American culture and the basic knowledge of intercultural communication, understand the cultural background and customs of major English-speaking countries, and have certain intercultural communication skills, sensitivity to cultural differences, tolerance and flexibility to deal with cultural differences.

(2) Teaching methods

1. Classroom teaching adheres to the principle of taking students as the main body of learning, focusing on the practical practice of students' language skills. Through the use of multimedia, supplemented by language text examples, audio materials and video materials, the language scene is simulated to help students carry out language comprehension and expression exercises, improve students' practical English use ability, and increase students' interest in English learning. Adopt a three-dimensional teaching mode driven by language output: classroom teaching + task-based learning + information-based teaching, combination of in-class and out-of-class, online and offline, and combination of speaking and listening, watching, reading and writing.

2. Assignments

Most of the homework is released through the FIF speaking training platform, with a time limit for completion, and a small part is sent in the form of voice homework through QQ, WeChat or email.

3. Thematic discussions

According to the teaching content, relevant special discussions, especially ideological and political special discussions, will be arranged to broaden learning ideas, improve the ability to analyze and solve problems, and help establish a correct outlook on life and values.

Formulated by: Wen Qiaoping, Director of the Department (Office) Review: Wenjing College Leader Review: Liu Xiangyou

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Syllabus of the University English Extension Course (2).

Course name	College English Enrichment Course (2).	Course number	9054311041						
English name	College English Extension (2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Lessons <input checked="" type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , independent development courses (compulsory <input type="checkbox"/> electives, <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Humanities/University English Language Teaching Department								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	College English (1), College English (2), etc								
Teaching materials and reference materials	Course textbook: Overview of English-speaking Countries (Revised Edition), edited by Xie Fuzhi, Foreign Language Teaching and Research Press References: Internet culture videos, "Overview of English-speaking countries", "The United States, Britain and Australia are proficient in the culture of the three countries", and teaching materials related to foreign cultural experience								

1、 Course Description:

College English Extension Course (2) is a general education course for sophomores majoring in water supply and drainage science and engineering. With the increasing frequency of China's foreign exchanges and the needs of foreign-related work, college students should not only learn English well and improve their language application skills, but also deepen their understanding of the basic situation of social and cultural life in English-speaking countries, so as to better carry out cross-cultural communication in work and life. This course is an elective course based on this need and in accordance with the "Teaching Requirements for College English Courses", which mainly introduces and explains the society and culture of British and American countries, covering geography, history, politics, economics, etc. All aspects of education and customs reflect the principle that English teaching must be closely combined with language teaching and cultural knowledge courses, which is conducive to the mutual promotion of language teaching and cultural knowledge teaching in the basic stage.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To grasp the geographical, historical, linguistic, cultural, and social information of British and American countries through the course study, and to understand British and American countries not only from the economic and political perspectives, but also from the social and cultural perspectives, and to understand British and American culture through neutral, appropriate, multi-angle, and practical investigations.

Course Objective 2: Excellent talents who can combine the basic knowledge of English language with the broad background knowledge of British and American cultures, and can better communicate and communicate across cultures based on understanding British and American cultures and the differences between Chinese and Western cultures.

Course Objective 3: To master the basic situation of geography, history, politics, economy, education, customs and other aspects of British and American countries, and have a certain international perspective, as well as the linguistic and cultural skills required to undertake international water supply and drainage projects.

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Course Objective 4: To be able to independently analyze English texts related to British and American culture, and to learn the English knowledge required for the international project of water supply and drainage engineering. Develop the habit of reading English newspapers and magazines, learn about the cutting-edge trends of water supply and drainage engineering in the United Kingdom and the United States, and learn their advanced industry technology and management experience.

(2) Teaching methods

1. Classroom teaching and self-directed learning

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is assigned corresponding exercises, including reflection questions, quiz questions, brainstorming, composition, etc. Deepen the understanding and mastery of the content taught in class, and develop students' ability to think, analyze and solve problems independently.

3. Cultural experience video viewing

In conjunction with classroom teaching, students are organized to watch cultural experience videos and videos, so that students can more intuitively experience the society, life and culture of English-speaking countries.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Longjuan Department (Office) Director Review: Wenjing College Leader Review: Liu Xiangyou

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Syllabus of Applied Writing

Course name	Practical Writing				Course number	9051111050			
English name	Applied Writing								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Humanities/University English Language Teaching Department								
Total credit hours	16	Credits	1.0	Theoretical hours	16	Practical hours	0	Computer-based hours	0
Prerequisites	not								
Teaching materials and reference materials	Course Textbook: "Applied Writing Practice" Fu Jian'an, Wu Zhiling, Editor-in-Chief, Chengdu: University of Electronic Science and Technology of China Press References: national document standards, online videos and related teaching materials, etc								

1、 Course Description:

Applied Writing is a professional foundation course offered by colleges and universities. On the basis of introducing the basic theories and basic knowledge, this course systematically introduces and teaches the knowledge and skills of applied document writing commonly used in current social life, which has strong practicability, operability and social practice, and effectively helps students to master the corresponding professional knowledge and professional skills. Improve the ability to apply knowledge of practical writing to daily work.

The ability to write in applied essays is one of the essential skills for students to work after graduation. Through the study of this course, students will be able to master the rules and methods of writing applied essays. This will not only directly improve the student's ability to actually write for the needs of future work. It can also promote the all-round development of students and improve the overall quality of students through the comprehensive training of reading and writing thinking, which is conducive to the sustainable development of students.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To master the basic theories and basic knowledge of applied writing, and to be able to skillfully use the knowledge of applied writing to deal with daily work.

Course Objective 2: To be proficient in writing all kinds of common application documents that are in line with national policies and laws, with correct views, substantial content, reasonable structure, clear hierarchy, clear expression, appropriate language and correct punctuation, and be able to standardize the writing of practical reports and professional design texts such as experiments and internships in the major.

Course Objective 3: Through the comprehensive training of reading and writing thinking, students can clearly express their personal views and design ideas, improve students' communication and communication skills, and promote students' all-round development and sustainable development.

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(2) Teaching methods

1. Equal emphasis on classroom teaching and self-directed learning

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Writing training

Thematic writing is assigned to each chapter to deepen the understanding and grasp of the content taught in class, and cultivate students' communication and exchange skills to write according to the requirements and clearly express personal views and design ideas.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Xiao Yan, Director of the Department (Office) Review: Wu Zhiling, College Leader Review: Liu Xiangyou

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Teaching syllabus of mental health education for college students

Course name	Mental health education for college students	Course number	9131311010						
English name	Mental health education for college students								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Student Affairs Department/Armed Forces Department/Student Affairs Office								
Total credit hours	32	Credits	1.0	Theoretical hours	12	Practical hours	20	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	Mental Health Education Course for College Students, edited by Hunan Provincial Department of Education, Hunan University Press								

1、 Course Description:

Psychology health education for university students It is a public compulsory course that integrates knowledge transfer, psychological experience and behavior training. It is in accordance with the spirit of the "Opinions on Further Strengthening and Improving the Mental Health Education of College Students" jointly issued by the Ministry of Education, the Ministry of Health and the Central Committee of the Communist Youth League, and is also established to meet the urgent needs of college students' self-growth. The course aims to enable students to clarify the standards and significance of mental health, enhance their awareness of self-mental health care and psychological crisis prevention, master and apply mental health knowledge, cultivate self-awareness, interpersonal communication and self-regulation skills, effectively improve their psychological quality, and promote their all-round development.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the teaching of this course, students will understand the relevant theories and basic concepts of psychology, clarify the standards and significance of mental health, understand the characteristics and abnormal manifestations of psychological development at the university level, and master the basic knowledge of self-adjustment.

Course Objective 2: To enable students to master self-exploration skills, psychological adjustment skills and psychological development skills through the teaching of this course. Such as learning and development skills, environmental adaptation skills, stress management skills, communication skills, problem-solving skills, self-management skills, interpersonal skills, and career planning skills.

Course Objective 3: Through the teaching of this course, students will establish an independent awareness of mental health development, understand their own psychological characteristics and personality characteristics, be able to objectively evaluate their physical conditions, psychological conditions, behavioral abilities, etc., correctly understand and accept themselves, be able to self-adjust or seek help when encountering psychological problems, and actively explore the living conditions that suit them and adapt to society.

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(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Case studies and group discussions

Each chapter arranges corresponding case discussions and group discussions to deepen understanding and grasp the content of the lectures, and cultivate students' ability to think, analyze and solve problems independently.

3. Hands-on experience

In conjunction with classroom teaching, organize corresponding practical courses to acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulator: Cao Zili, Director of the Department (Office) Review: Sun Fang, College Leader Review: Kuang Yanqun

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Career Development and Career Guidance for College Students (1) Syllabus

Course name	Career Development and Career Guidance for College Students (1)	Course number	9151311010						
English name	Career Development and Career Guidance for College Students(1)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Admissions and Employment Office								
Total credit hours	20	Credits	0.5	Theoretical hours	8	Practical hours	12	Computer-based hours	0
Prerequisites	not								
Teaching materials and reference materials	Course textbooks: 1. Career Development and Employment Guidance for College Students, edited by Cao Min, Hunan Science and Technology Press, 2012.								

1、 Course Description:

The course "Career Development and Employment Guidance for College Students (1)" not only emphasizes the important position of career in life development, but also pays attention to the all-round development and lifelong development of students. Encourage college students to rationally plan their own development plans by choosing the ways and methods that suit them; Through the training and guidance of certification, postgraduate examination, grading examination and civil service examination, college students can further clarify the development goals of the university study stage, and strive to consciously improve their employability and career management ability in the learning process.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1、 Course Teaching Objectives

Through the course teaching, college students should achieve the following goals in three aspects: attitude, knowledge and skills:

Course Objective 1: College students should establish a sense of autonomy in career development, establish a positive and correct outlook on life, values and employment concepts, combine personal development with national needs and social development, establish the concept and awareness of career, and be willing to take the initiative to make positive efforts for personal career development and social development.

Course Objective 2: To have a basic understanding of the characteristics of career development, to have a clear understanding of one's own characteristics, occupational characteristics and social environment through the Holland Career Interest Test and other methods, to understand the employment situation and policies and regulations, and to master the basic knowledge of labor market information and related occupational classifications.

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Course Objective 3: Basic understanding of the acquisition of professional qualification certificates related to the major, the selection and preparation of the major, direction and school for the postgraduate examination, the English level 4 and 6 examination, civil servants, selection and transfer students and other related knowledge.

(2) Teaching methods

1. Classroom teaching

Introduce relevant theoretical knowledge in detail.

2. Assignments

Complete the writing of the career plan and draw the rainbow diagram of life.

3. Classroom tests and discussions

Complete the Holland Career Interest Test and share it with your classmates.

4. Special lectures or exchange meetings

According to the arrangement of the college, participate in the postgraduate examination exchange meeting, public welfare training, etc.

Formulated by: Yang Guanghui, Director of the Department (Office) Review: Tang Zhengjun, College Leader

Review: Li Mengxing

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Career Development and Career Guidance for College Students (2) Syllabus

Course name	Career Development and Career Guidance for College Students(2)	Course number	9151311020						
English name	Career Development and Career Guidance for College Students(2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Admissions and Employment Office								
Total credit hours	18	Credits	0.5	Theoretical hours	4	Practical hours	14	Computer-based hours	
Prerequisites	not								
Teaching materials and reference materials	Course textbook: Career Development and Employment Guidance for College Students, edited by Cao Min, Hunan Science and Technology Press, 2012.								

1、 Course Description:

The course "Career Development and Employment Guidance for College Students (2)" mainly analyzes the current national employment situation and the employment situation of the university in recent years, combined with the relevant employment policies of governments at all levels, so that students can understand the employment situation and policies and regulations, and grasp the basic labor market information. Guide students to cultivate a good career mentality and psychological quality, guide students to fully understand their own characteristics and potential, enhance self-confidence, and overcome inferiority complex; Master resume making and interview skills, master self-exploration skills, information search and management skills, career decision-making skills, job search skills, etc., improve students' various general skills, including communication skills, problem solving skills, self-management skills and interpersonal skills, etc., with a positive and healthy attitude to face and participate in employment competition, and obtain their own satisfactory jobs.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

2、 Course Teaching Objectives

Through the course, college students are expected to achieve the following goals in job interviews:

Course Objective 1: To have a basic understanding of the employment situation of college students and their school-based majors in recent years, as well as the relevant employment policies issued by various departments and governments, to establish a correct outlook on career choice, and to determine employment goals.

Course Objective 2: Master self-exploration skills, information search and management skills, career decision-making skills, etc., and improve students' various general skills, including communication skills, problem-solving skills, self-management skills, and interpersonal skills.

Course Objective 3: Basic understanding of the channels and methods of obtaining employment information and employment procedures, mastering the methods of resume making and workplace etiquette, and achieving employment through interviews, etc.

(2) Teaching methods

1. Classroom teaching

Introduce relevant theoretical knowledge in detail.

2. Discussion and assignments

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Complete a qualified resume.

3. Watch the video

Workplace etiquette and a complete interview process.

4. On-site observation

Attend various job fairs held at the school to learn about the recruitment process.

Formulated by: Yang Guanghui, Director of the Department (Office) Review: Tang Zhengjun, College Leader

Review: Li Mengxing

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Basic syllabus of innovation and entrepreneurship

Course name	Foundation of innovation and entrepreneurship	Course number	9163311010						
English name	Innovation and entrepreneurship education								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input checked="" type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Engineering Training Center/School of Applied and Innovation Entrepreneurship								
Total credit hours	32	Credits	1.0	Theoretical hours	8	Practical hours	24	Computer-based hours	0
Prerequisites									
Teaching materials and teaching resources	Course textbook: Innovation and Entrepreneurship Course for College Students, edited by Qiu Wenwei, Xi'an Jiaotong University Press, 2016 References: College Student Entrepreneurship Service Network, etc								

1、 Course Description:

The purpose of this course is to enable students to master the basic knowledge and basic theories of innovation and entrepreneurship, be familiar with the basic process and basic methods of innovation and entrepreneurship, understand the relevant policies and laws and regulations of innovation and entrepreneurship, and stimulate students' innovative spirit, entrepreneurial awareness and innovation and entrepreneurship ability. Cultivate students' teamwork spirit, improve students' sense of social responsibility, comprehensively improve students' comprehensive quality, lay the foundation for students' follow-up innovation and entrepreneurship practice and even employment and entrepreneurship, and promote students' all-round development.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course objective 1: To enable students to understand the cutting-edge dynamics and development trends of the industry, be familiar with relevant policies and laws and regulations, consciously follow the laws of innovation and entrepreneurship, cultivate students' innovative spirit, master the methods, theories and techniques of innovative thinking, actively adapt to the needs of national economic and social development and personal all-round development, have the necessary innovation and entrepreneurship ability, and actively participate in the practice of innovation and entrepreneurship.

Course Objective 2: To understand the importance of entrepreneurs and teams, cultivate students' teamwork spirit, learn the way of thinking of forming a team and its impact on innovation and entrepreneurship activities, understand the role and role of innovation and entrepreneurship team leaders, and master the skills, strategies and basic methods of forming and managing innovation and entrepreneurship teams.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

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It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Guo Zijia Director of the Department (Office) Review: Guo Zijia College Leader Review: Jiang Dongchu

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Syllabus of military theory for college students

Course name	Military course tutorial for college students				Course number	9132311020			
English name	Military courses for college students								
Applicable majors	All students in the school								
Nature of the course	Public compulsory courses								
Total credit hours	36	Credits	2	Theoretical hours	12	Practical hours	24	Computer-based hours	0
Prerequisites									
Refer to textbooks	"New Military Course Curriculum for Colleges and Universities", edited by Professor Zhao Rong, National University of Defense Technology Press, June 2017; "Military Course Course for College Students", edited by Professor Li Xiande, Beijing Institute of Technology Press First edition, July 2016								

1. Course Introduction

The College Students Military Course is a compulsory public course for freshmen, with a total of 32 hours of teaching content: China's national defense, national security, military thought, modern warfare, and information equipment. In addition, we should take advantage of the National Defense Education Day to promote the development of national defense education by participating in national defense education bases and holding national defense knowledge contests.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: In the teaching process, it is advisable to use group discussions, keynote speeches, special debates, noun interpretation, picture appreciation and other forms to show the opportunities and challenges faced by peripheral security, China's national defense modernization, the development of military strategists and their ideas, the progress of military science and technology, the comparison of advanced weapons and equipment between China and foreign countries, and the form of warfare in the information age, so that students can feel the joy of improving their innovation ability in the process of diverging and converging their thinking.

Course Objective 2: Ability to Analyze Problems: On the basis of students' proficiency in the basic knowledge of each part, students are required to integrate and grasp the system scientifically. How to analyze the strategic environment as a major premise, clearly understand the characteristics of the current international military strategic pattern and the future development trend, and find out the advantages and problems of the international and domestic environment in which China is located.

Course Objective 3: Responsibility and Responsibility: Through intensive learning, young people can be edified with patriotism education, heroism and other multi-level, multi-angle and multi-element edification, which can effectively stimulate patriotism, serve the national situation and strengthen the country's aspirations, so that they can truly become "the pillars of society" and provoke "the heavy responsibility of China".

Course Objective 4: Ability to abide by the law: The duty of a soldier is to obey orders, and all actions are subject to commands.

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(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Liu Hong, Director of the Galaxy (Office) Review: Cai Yingjie College Leader Review: He Zhengyi

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Basic Computer Science Syllabus for College Students

Course name	Computer Fundamentals for College Students	Course number	9063311011						
English name	Computer Fundamentals for College Students								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input checked="" type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> independent development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	Faculty of Information and Electronic Engineering								
Total credit hours	32	Credits	1,5	Theoretical hours	16	Practical hours	0	Computer-based hours	16
Prerequisites	not								
Refer to textbooks	Course textbooks: "University Computer", "University Computer Practice Course", edited by Mo Zhao et al., Beijing University of Posts and Telecommunications Press References: Basic Computer Theory and Operation Manuals, etc								

1、 Course Description:

College Students' Computer Foundation is a public compulsory course, the first computer foundation course for non-computer science majors, and a prerequisite course for continuing to study other computer courses, which is set up to cultivate college students' computer culture awareness. The content of this course mainly includes basic computer knowledge, basic use of operating system, Office series office software applications, basic knowledge of computer network and network security, basic application of Internet, basic knowledge and application of multimedia technology. The course content is based on the basic operation of the computer, focusing on the application of Office series office software in practical work.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

The overall goal of this course is to enable students to master the basic knowledge and fundamentals of computer science through this course

Operation, be able to skillfully use Office series office software, and initially have the ability to use computer to analyze and solve problems, so as to lay the foundation for further learning other computer courses and applying computer knowledge and skills to solve practical problems in the major.

Course Objective 1: To be familiar with the basic components of a microcomputer system and the functions of each component, and to be familiar with the typical application areas of computers.

Course Objective 2: Familiarize yourself with the basic functions of the computer operating system and master the basic use of the Windows operating system.

Course Objective 3: Proficiency in the application of common office software such as word processing software, spreadsheet software, presentation making software, etc., familiar with the basic knowledge of computer network and network security, and master the basic application of the Internet (Internet).

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

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2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Xi Shengfeng, Director of the Department (Office) Review: He Qian College Leader Review: Tan Weishi

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Computer Language (C Language) syllabus

Course name	Computer Language (C)	Course number	9063311021						
English name	C programming								
Applicable majors	The whole school is not a computer major and is a science and engineering major								
Nature of the course	General education courses, <input checked="" type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Information and Electronic Engineering								
Total credit hours	64	Credits	3,0	Theoretical hours	32	Practical hours	32	Computer-based hours	0
Prerequisites	Introduction to Computational Thinking B								
Teaching materials and reference materials	Course Textbook: C Programming (Fourth Edition), edited by Tan Haoqiang, Tsinghua University Press References: C programming manuals, specifications, related textbooks, etc								

1、 Course Description:

This course is open to all undergraduate (science and engineering) students who are not majoring in computer science, and is a compulsory general education course in the teaching plan. This course is an introductory course for students to learn programming and software development, and the computer programming language (C language) is an efficient and practical procedural programming language, which is a very important professional basic course for undergraduate (science and engineering) students who are not majoring in computer science. Through the study of "C Programming", students will form basic abstract thinking of programming (process-oriented programming thinking), master the basic syntax knowledge of high-level language and the basic steps of debugging programs, initially master the "top-down, step-by-step" programming methods and basic specifications of programming, and understand the characteristics of C language and its computer-related knowledge. Lay the groundwork for continuing with other courses in computing. Through learning, students will not only master the knowledge of high-level programming languages, programming techniques and basic algorithms, but also master the ideas and methods of programming, and have the ability to use computers to solve practical problems, and be able to flexibly use high-level languages for programming. As a result, this course is highly theoretical and practical.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Master the basic methods of program design and the basic steps of debugging programs;

Course Objective 2: Master the rules of defining functions and simple calls;

Course Objective 3: Master the basic methods of using sequential structure, selection structure and cyclic structure for simple program design, master classical algorithms and be able to design some commonly used simple algorithms;

Course Objective 4: Master the use of one-dimensional and two-dimensional arrays;

(2) Teaching methods

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1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussion

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Xi Shengfeng, Director of the Department (Office) Review: He Qian College Leader Review: Tan Weishi

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University Physical Education and Health Course (1) Syllabus

Course name	University Physical Education and Health (1)	Course number	9103811010						
English name	College Athletics								
Applicable majors	Non-sports majors								
Nature of the course	General Education Lessons <input checked="" type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> and self-development courses (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Physical education institute								
Total credit hours	32	Credits	1.0	Theoretical hours	20	Practical hours	12	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	University Physical Education and Health Education, National Publishing House, edited by Professor Bai Jinxiang, "College Sports Theory and Practice Course", National Publishing House, edited by Professor Bai Jinxiang								

1、 Course Description:

Physical education course is a public compulsory course for college students to enhance physical fitness, improve health and improve physical literacy through reasonable physical education and scientific physical exercise process. It is an important part of the school curriculum system; It is the central link of sports work in colleges and universities; It is an indispensable and important way to implement quality education and cultivate all-round development talents.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Sports participation goal: actively participate in various sports activities and basically form the habit of conscious exercise, basically form a lifelong formPhysical activityawareness of the ability to compile a feasible personal exercise plan with a certainPhysical cultureViewing ability.

Course Objective 2:Motor skillsGoal: Proficient in two or more basic methods and skills of fitness sports, and be able to carry out them scientificallyPhysical activity, improve their athletic ability, master the commonSports injuriesmethod of disposal.

Course Objective 3: Physical Health Objective: To be able to test and evaluate physical health, master the knowledge and methods to effectively improve physical fitness and develop physical fitness in an all-round way; Develop good habits of behavior and form a healthy social way; Have a healthy body.

Curriculum Objective 4: Mental Health Goals: Set physical learning objectives based on your abilities; Be able to consciously improve their psychological state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; Use appropriate methods to regulate your emotions; Experience the joy of sports and the feeling of success in sports.

Course Objective 5:Social adaptationObjective: To show good sportsmanship and cooperation, and to correctly handle the relationship between competition and cooperation.

(2) Teaching methods

1. Pay equal attention to on-site teaching and training

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Cooperate with on-site teaching and organize corresponding on-site training.

Formulated by: Zhang Xufeng/Li Le, Director of the Department (Office) Review: Ouyueshan College Leader

Review: Guo Yu

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University Physical Education and Health Course (2) Syllabus

Course name	University Physical Education and Health (2)	Course number	9103811020						
English name	College Athletics								
Applicable majors	Non-sports majors								
Nature of the course	General Education Lessons <input checked="" type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> and self-development courses (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Physical education institute								
Total credit hours	32	Credits	1.0	Theoretical hours	20	Practical hours	12	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	University Physical Education and Health Education, National Publishing House, edited by Professor Bai Jinxiang, "College Sports Theory and Practice Course", National Publishing House, edited by Professor Bai Jinxiang								

1、 Course Description:

Physical education course is a public compulsory course for college students to enhance physical fitness, improve health and improve physical literacy through reasonable physical education and scientific physical exercise process. It is an important part of the school curriculum system; It is the central link of sports work in colleges and universities; It is an indispensable and important way to implement quality education and cultivate all-round development talents.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Sports participation goal: actively participate in various sports activities and basically form the habit of conscious exercise, basically form a lifelong formPhysical activityawareness of the ability to compile a feasible personal exercise plan with a certainPhysical cultureViewing ability.

Course Objective 2:Motor skillsGoal: Proficient in two or more basic methods and skills of fitness sports, and be able to carry out them scientificallyPhysical activity, improve their athletic ability, master the commonSports injuriesmethod of disposal.

Course Objective 3: Physical Health Objective: To be able to test and evaluate physical health, master the knowledge and methods to effectively improve physical fitness and develop physical fitness in an all-round way; Develop good habits of behavior and form a healthy social way; Have a healthy body.

Curriculum Objective 4: Mental Health Goals: Set physical learning objectives based on your abilities; Be able to consciously improve their psychological state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; Use appropriate methods to regulate your emotions; Experience the joy of sports and the feeling of success in sports.

Course Objective 5:Social adaptationObjective: To show good sportsmanship and cooperation, and to correctly handle the relationship between competition and cooperation.

(2) Teaching methods

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1. Pay equal attention to on-site teaching and training

Cooperate with on-site teaching and organize corresponding on-site training.

Formulated by: Zhang Xufeng/Li Le, Director of the Department (Office) Review: Ouyueshan College Leader
Review: Guo Yu

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University Physical Education and Health Course (3) Syllabus

Course name	University Physical Education and Health(3)	Course number	9103811030						
English name	College Athletics								
Applicable majors	Non-sports majors								
Nature of the course	General Education Lessons <input checked="" type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> and self-development courses (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Physical education institute								
Total credit hours	20	Credits	0.5	Theoretical hours	20	Practical hours	0	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	University Physical Education and Health Education, National Publishing House, edited by Professor Bai Jinxiang, "College Sports Theory and Practice Course", National Publishing House, edited by Professor Bai Jinxiang								

1、 Course Description:

Physical education course is a public compulsory course for college students to enhance physical fitness, improve health and improve physical literacy through reasonable physical education and scientific physical exercise process. It is an important part of the school curriculum system; It is the central link of sports work in colleges and universities; It is an indispensable and important way to implement quality education and cultivate all-round development talents.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Sports participation goal: actively participate in various sports activities and basically form the habit of conscious exercise, basically form a lifelong formPhysical activityawareness of the ability to compile a feasible personal exercise plan with a certainPhysical cultureViewing ability.

Course Objective 2:Motor skillsGoal: Proficient in two or more basic methods and skills of fitness sports, and be able to carry out them scientificallyPhysical activity, improve their athletic ability, master the commonSports injuriesmethod of disposal.

Course Objective 3: Physical Health Objective: To be able to test and evaluate physical health, master the knowledge and methods to effectively improve physical fitness and develop physical fitness in an all-round way; Develop good habits of behavior and form a healthy social way; Have a healthy body.

Curriculum Objective 4: Mental Health Goals: Set physical learning objectives based on your abilities; Be able to consciously improve their psychological state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; Use appropriate methods to regulate your emotions; Experience the joy of sports and the feeling of success in sports.

Course Objective 5:Social adaptationObjective: To show good sportsmanship and cooperation, and to correctly handle the relationship between competition and cooperation.

(2) Teaching methods

1. Pay equal attention to on-site teaching and training

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Cooperate with on-site teaching and organize corresponding on-site training.

Formulated by: Zhang Xufeng/Li Le, Director of the Department (Office) Review: Ouyueshan College Leader
Review: Guo Yu

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University Physical Education and Health Course (4) Syllabus

Course name	University Physical Education and Health (4)	Course number	9103811040						
English name	College Athletics								
Applicable majors	Non-sports majors								
Nature of the course	General Education Lessons <input checked="" type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> and self-development courses (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Physical education institute								
Total credit hours	20	Credits	0.5	Theoretical hours	20	Practical hours	0	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	University Physical Education and Health Education, National Publishing House, edited by Professor Bai Jinxiang, "College Sports Theory and Practice Course", National Publishing House, edited by Professor Bai Jinxiang								

1、 Course Description:

Physical education course is a public compulsory course for college students to enhance physical fitness, improve health and improve physical literacy through reasonable physical education and scientific physical exercise process. It is an important part of the school curriculum system; It is the central link of sports work in colleges and universities; It is an indispensable and important way to implement quality education and cultivate all-round development talents.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Sports participation goal: actively participate in various sports activities and basically form the habit of conscious exercise, basically form a lifelong formPhysical activityawareness of the ability to compile a feasible personal exercise plan with a certainPhysical cultureViewing ability.

Course Objective 2:Motor skillsGoal: Proficient in two or more basic methods and skills of fitness sports, and be able to carry out them scientificallyPhysical activity, improve their athletic ability, master the commonSports injuriesmethod of disposal.

Course Objective 3: Physical Health Objective: To be able to test and evaluate physical health, master the knowledge and methods to effectively improve physical fitness and develop physical fitness in an all-round way; Develop good habits of behavior and form a healthy social way; Have a healthy body.

Curriculum Objective 4: Mental Health Goals: Set physical learning objectives based on your abilities; Be able to consciously improve their psychological state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; Use appropriate methods to regulate your emotions; Experience the joy of sports and the feeling of success in sports.

Course Objective 5:Social adaptationObjective: To show good sportsmanship and cooperation, and to correctly handle the relationship between competition and cooperation.

(2) Teaching methods

1. Pay equal attention to on-site teaching and training

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Cooperate with on-site teaching and organize corresponding on-site training.

Formulated by: Zhang Xufeng/Li Le, Director of the Department (Office) Review: Ouyueshan College Leader

Review: Guo Yu

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Syllabus of Higher Mathematics A (1).

Course name	Further Mathematics A(1)	Course number	9092112011						
English name	Further Mathematics A(1).								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Science								
Total credit hours	72	Credits	4.5	Theoretical hours	72	Practical hours	0	Computer-based hours	0
Prerequisites	Middle School Mathematics								
Teaching materials and reference materials	Course materials: Song Yingqing, etc. Advanced Mathematics (I)[M]. Changsha:Hunan Science and Technology Press,2018(in Chinese). Reference: Huang Lihong, Editor-in-Chief, Advanced Mathematics (I)[M].Beijing:Peking University Press,2018.								

1、 Course Description:

The course of "Advanced Mathematics" is an important compulsory course of natural foundation, degree course and graduate entrance examination course for students of various majors in colleges and universities, and it is to serve the training of high-quality specialized talents needed for China's socialist modernization. The purpose of this course is to enable students to acquire the basic concepts, basic theories and basic arithmetic skills in univariate calculus, multivariate calculus, spatial analytic geometry and vector algebra, infinite series (including Fourier series) and ordinary differential equations, etc., so as to lay the necessary mathematical foundation for subsequent courses and further study of other courses.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1、 Course Teaching Objectives

Through the theoretical teaching and self-directed learning of students, students will be equipped with basic knowledge and abilities, and the specific course objectives are as follows:

Course Objective 1. Through the students' reading and the teacher's teaching, the students' understanding of the limits of the number series and functions can be realized from abstract qualitative to concrete quantitative analysis. Master the concepts and properties of infinitesimal quantities and infinitely large quantities, be proficient in using the algorithm of limits to calculate the limits of sequences and functions, and skillfully apply equivalent infinitesimal and two important limits; For the existence of the limits of sequences and functions, the properties are used to prove the performance. On the basis of understanding the limit theory of functions, students will grasp the concept and properties of function continuity.

Course Objective 2. Through teaching, students will understand the concepts and properties of derivatives and differentials, and be able to use the definition and properties of derivatives to derive the derivative formulas and derivation rules of basic elementary functions. Proficient in calculating the first and second derivatives of functions represented by general inverse functions, composite functions, and parametric equations, and can

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calculate higher-order derivatives if necessary; For the curvature of curves, the relevant rate of change and the solution of economic problems, students are required to fully understand the intrinsic meaning of derivatives on the basis of learning the basic knowledge, basic concepts and basic formulas of derivatives, and fully apply them to engineering practice.

Course Objective 3. Through the study, students will be able to flexibly apply the conditions and conclusions of several differential median theorems (Rolle's theorem, Lagrange's theorem, Cauchy's theorem, and Taylor's theorem) to solve related problems (monotonicity of functions, limits of infinitives, extrema and maximum values of functions, concave and convexity of functions, and inflection points of functions, and asymptotic lines of curves).

Course Objective 4. Through the learning of derivatives and the understanding of inverse operations, students will understand the concepts of original functions and indefinite integrals, master the commutative integration method of indefinite integrals, the partial integration method and the methods of finding indefinite integrals of some special functions, so as to lay the foundation for the calculation of definite integrals in the next chapter.

Course Objective 5. Through the proposal and solution of practical problems, students can fully understand the concept and connotation of definite integrals. Master the basic formulas of calculus and the calculation of definite integrals; Master the idea of the micro-element method, and fully demonstrate the application of definite integrals in geometry and physics; Understand the concept and determination of anomalous integrals; The approximate calculation of definite integrals can be given to students for later use.

Course Objective 6. The solution of ordinary differential equations is mainly through the study of integral functions of unary functions, and on the basis of understanding the basic concepts of differential equations, master the solution methods of first-order differential equations, reduced-order differential equations and second-order linear differential equations. Through examples, students can understand the application of differential equations in real life, so that they can flexibly apply differential theory to practice.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

Through self-directed learning, cooperative learning, inquiry-based learning, discovery-based learning, group learning, and communicative learning, students are trained to use the knowledge they have learned, their innovative spirit and practical ability, so that students can form a positive learning attitude and a healthy and upward attitude towards life.

Teaching Methods and Teaching Philosophy: Learn mathematics by solving practical problems, and at the same time learn how to solve practical problems in learning mathematical knowledge.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

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According to the teaching content and class time, necessary special discussions are arranged to broaden learning ideas and improve students' ability to analyze and solve problems.

Formulated by: Sun Hui Department (Office) Director Review: Guo Bingyang College Leader Review: Zhou Shuangshuang

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Syllabus of Higher Mathematics A (2).

Course name	Further Mathematics A (2)	Course number	9092112021						
English name	Advanced Mathematics (2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Science								
Total credit hours	80	Credits	5,0	Theoretical hours	80	Practical hours	0	Computer-based hours	0
Prerequisites	Advanced Mathematics I								
Teaching materials and reference materials	Course Materials: Zhou Shuangshuang, etc. Advanced Mathematics II[M]. Changsha:Hunan Science and Technology Press,2020. Reference: Huang Lihong, editor-in-chief. Beijing:Peking University Press,2018.								

2、 Course Description:

Higher Mathematics is an important public basic theory course for all majors in engineering colleges. The object of study is a function (the dependence of quantities in the process of change). The main contents include function, limit, continuous, unary function differentiation, unary function integral, vector algebra and spatial analytic geometry, multivariate function differentiation, multivariate function integration, infinite series and ordinary differential equations, etc. The main task of this course is to gradually cultivate students' abstract thinking ability, logical thinking ability, spatial imagination ability and self-learning ability through various teaching links, and at the same time cultivate students' proficient computing ability and comprehensive application of the knowledge they have learned to analyze and solve problems. It enables students to master the basic concepts, basic theories and basic arithmetic skills of calculus, and lays the necessary mathematical foundation for students to further study subsequent courses and further improvement.

3、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the course study, master the basic knowledge and basic skills of advanced mathematics, understand the relationship between advanced mathematics and water supply and drainage science and engineering, understand the knowledge context structure system of advanced mathematics, and be able to apply it to solve complex engineering problems.

Course Objective 2: To acquire the mathematical knowledge, professional knowledge and skills required in the field of water supply and drainage science and engineering, and to be able to apply professional engineering principles and techniques to design feasible and reasonable solutions to complex engineering problems.

Course Objective 3: To master the mathematical calculation and data processing capabilities required for planning, design, construction, operation, management and other work in the field of water supply and drainage science and engineering, and to have strong industry competitiveness in the construction of new urbanization and regional economic development.

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Course Objective 4: To be able to solve complex engineering problems in water supply and drainage science and engineering, and to have strong professional collaboration, technical collaboration, teamwork and other abilities.

Course Objective 5: Through course learning, students will have a certain international vision and sustainable development concept, be able to judge the development trend of the field they are engaged in, and have the ability to continue learning and adapt to development needs.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises and module tests

Corresponding exercises are assigned to the content of each chapter, and 2-3 tests are conducted according to the teaching knowledge structure and modules. The test questions and exercises include thinking questions, quiz questions and calculation questions, which deepen the understanding and mastery of the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Discuss guidance

According to the teaching content and class time, special discussions on the application of advanced mathematics in water supply and drainage science and engineering will be arranged to broaden learning ideas and improve the ability to analyze and solve problems.

Formulated by: Cai Xia, Director of the Department (Office) Review: Guo Bingyang, College Leader Review:
Zhou Shuangshuang

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Linear Algebra Syllabus

Course name	linear algebra				Course number	9092112051			
English name	linear algebra								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/> , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Science/Faculty of Teacher Education								
Total credit hours	40	Credits	2.5	Theoretical hours	40	Practical hours	0	Computer-based hours	0
Prerequisites	Further Mathematics								
Teaching materials and reference materials	Course materials: Li Junfeng et al. Linear algebra[M]. Changsha:Hunan Science and Technology Press,2019. Reference: Department of Mathematics, Huazhong University of Science and Technology. Linear algebra[M]. Beijing: Higher Education Press, 2008. ZHOU Yong. Linear algebra[M]. Beijing: Peking University Press, 2018. LIU Xianzhong. Linear Algebra (2nd Edition)[M]. Beijing: Higher Education Press, 2003. MAO Gangyuan. Summary of Linear Algebra Problem Solving Methods and Skills[M]. Wuhan: Huazhong University of Science and Technology Press, 2015.								

1、 Course Description:

Linear AlgebraThe course is an important public basic theory course for all majors in higher engineering colleges. With the development of modern science and technology, especially computer science, solving large linear equations, calculating the eigenvalues and eigenvectors of matrices has become a frequent problem in the field of engineering technology. Therefore, the role and status of linear algebra are more important. The main task of this course is to learn the matrix methods, linear equations and the basic calculation methods related to them commonly used in science and technology. It enables students to have proficient matrix operation ability and the ability to solve some practical problems with matrix methods. In this way, students will be able to lay the necessary mathematical foundation for further study and further improvement.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with basic knowledge and ability, and the specific course objectives of the course are as follows:

Course Objective 1. Through learning, students will master the relevant concepts and properties of determinants, and be able to skillfully use the properties of determinants to calculate determinants, and apply the two basic calculation determinants of the triangle method and the price reduction method. understand algebraic coadopters and Klem's law; Cultivate students' ability to calculate and deduce determinants.

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Course Objective 2. Through learning, students will understand the concept of matrices and master various arithmetic laws of matrices, especially the mixed arithmetic laws of squares and determinants. Master the determination of matrix reversibility and the method of finding inverse matrices, and be able to use the properties of inverse matrices to perform matrix operations and solve simple matrix equations; Understand the concept of elementary matrices and their relationship to the elementary transformation of matrices, and be proficient in finding the rank of matrices. To cultivate students' ability to calculate and deduce matrices, and to use the basic principles of matrices to identify complex engineering problems in civil engineering.

Course Objective 3. Through learning, students will master the determination of the solution of linear equations and the elimination method; Master the discriminant method of linear correlation of vector groups, and be proficient in finding the rank and greatly independent groups of vector groups; Master the conditions and solutions of homogeneous linear equations and the structure of their solutions, master the conditions and solutions of non-homogeneous linear equations and the structure of their solutions, and be proficient in using elementary transformation methods to find the solutions and basic solution systems of linear equations. Students are trained to use the knowledge of linear equations to model and solve complex engineering problems in civil engineering. Through teaching, students will understand the concepts and properties of eigenvalues and eigenvectors, similarity matrices and quadratic forms, and the sufficient and necessary conditions for matrices to be similar to diagonal arrays. Cultivate students' ability to calculate and deduce matrix diagonalization.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

Mainly lectures, combined with online learning, and arrange after-class discussions and Q&A.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Director of the Department (Office) of Stability Review: Guo Bingyang College Leadership
Review: Zhou Shuangshuang

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Syllabus of Probability Theory and Mathematical Statistics

Course name	Probability Theory and Mathematical Statistics	Course number	9092112061						
English name	Probability and Mathematical Statistics								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Science								
Total credit hours	32	Credits	2,0	Theoretical hours	32	Practical hours	0	Computer-based hours	0
Prerequisites	Advanced Mathematics, Linear Algebra, etc								
Teaching materials and reference materials	Course textbook: Probability Theory and Mathematical Statistics, edited by Jin Fang et al., Hunan Science and Technology Press Reference: Probability theory and mathematical statistics[M].Huang Xin et al., eds. Beijing: China Railway Press, 2016								

1、 Course Description:

Probability theory is the process of first transforming random phenomena into mathematical models one by one, and then translating each mathematical model

The nature, characteristics and laws are studied, and finally the probability of the occurrence of the corresponding random phenomenon is given, which embodies the idea of mathematical modeling.

Mathematical statistics is based on the collection of data related to random phenomena, and people use probability

The theory of the collected data is analyzed and studied, and finally the regularity of the corresponding random phenomena is generalized and deduced.

It is probability statistics to explore the statistical regularity of random phenomena and use these laws to serve human beings

Task.

The key to learning this course well is to connect the basic concepts, theorems and methods with practical examples, and master the language of probability and statistics to describe practical problems, that is, to represent problems as random events, probabilities, probability distributions and numerical features, etc., and then select appropriate probability and statistical models and correct theorems and formulas for calculation.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To enable students to master the basic concepts of probability theory, and to be proficient in using the relationship and operation of random events and the basic properties of probability to solve classical probability and geometric probability problems. Understand the definition of conditional probability, the concept of the independence of random events, and master the method of calculating the probability of event independence using the full probability formula and Bayesian formula.

Course Objective 2: To enable students to understand the definition, properties and calculations of one-dimensional random variables and their distribution functions. Proficient in the definition, properties and

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calculation of one-dimensional discrete random variable distribution law, one-dimensional continuous random variable density function and related probability problems; understand the distribution law or density function in relation to the distribution function; Master probabilistic models of common distributions and the solution of related probabilistic problems; Master the distribution law of one-dimensional discrete random variable functions and the density function of one-dimensional continuous random variables.

Course Objective 3: To enable students to understand the definition and properties of two-dimensional random variables and their joint distribution functions, joint distribution laws, and joint density functions. Master the relationship between edge distribution (edge distribution function, edge distribution law, edge density function) and joint distribution (joint distribution function, joint distribution law, joint density function); the probability of skillfully resolving the relevant event; Master the definition of conditional distribution law, conditional density function and conditional distribution function, as well as their relationship with joint distribution and edge distribution; Memorize the density function of a two-dimensional uniform distribution and understand the density function of a two-dimensional normal distribution; grasp the nature of two-dimensional normal distributions and understand their important conclusions; Understand the concept of independent random variables, and master their determination methods and properties; Understand the calculation of the distribution of functions of two-dimensional random variables, and be proficient in the probability distributions of sum, quotient, maximum, and minimum values of random variables that are independent of each other.

Course Objective 4: To enable students to understand the definitions of mathematical expectations, variance, covariance, and correlation coefficients for discrete and continuous random variables; Familiar with the nature of mathematical expectations, variance, covariance, correlation coefficients; Proficient in the calculation of mathematical expectations and variance; Memorize the mathematical expectations and variances of common distributions and be able to solve related problems; Understand the definition of moments.

Course Objective 5: To enable students to understand the main content and ideas of mathematical statistics through learning; understand the basic concepts of mathematical statistics; grasp the calculation methods of commonly used statistics and their related properties; Master the definition and nature of the three sampling distributions, be able to use the normal distribution and the three sampling distributions to judge the distribution of common statistics of a single normal population, and be able to look up tables to solve related probability problems.

Course Objective 6: To enable students to understand the concept of point estimation and master two methods of point estimation: moment estimation and maximum likelihood estimation. Understand the three evaluation criteria for point estimation: the definition of unbiasedness, validity, and coexistence; Understand the concepts and meanings of parameter interval estimation, confidence level, and confidence interval, and master the method and conclusion of the confidence interval of unnormal population parameters.

Course Objective 7: To provide students with an understanding of the concepts of null hypotheses and alternative hypotheses through teaching; understand the basic idea of the significance level test; Master the basic steps of hypothesis testing and the two types of errors that can occur.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Practice after class

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Each chapter is equipped with corresponding exercises, including quiz questions, calculation questions, thinking questions, and improvement questions, to deepen understanding and master the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Cheng Hongyan Department (Office) Director Review: Guo Bingyang College Leadership Review:

Zhou Shuangshuang

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College Physics (1) Syllabus

Course name	University Physics (1)					Course number	9065112011		
English name	University Physics (1)								
Applicable majors	Science and engineering majors								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/> , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Information and Electronic Engineering (Department of Physics and Optoelectronic Engineering)								
Total credit hours	48	Credits	3,0	Theoretical hours	48	Practical hours	0	Computer-based hours	0
Prerequisites	Further Mathematics								
Teaching materials and teaching resources	Course Materials: Yao Yingbo. University Physics[M]. Harbin: Harbin Institute of Technology Press, 2018. Reference: http://www.icourses.cn/sCourse/course_2182.html Teaching website: http://v.dxsbb.com/ligong/305/								

1. Course Introduction

Physics is the science that studies the most universal and basic forms of motion in the material world and their laws. It is the foundation of many natural sciences and engineering technologies. For higher engineering majors, College Physics is an important compulsory basic course, which is closely related to many basic courses and technical basic courses.

Through the study of this course, students will have a comprehensive and systematic understanding of the basic concepts, basic principles and basic laws of physics, understand the relationship between various forms of motion, and have a general understanding of the modern development and new achievements of physics. To enable students to receive preliminary and rigorous training in scientific experiment ability, calculation ability and abstract thinking ability; To familiarize students with the basic ideas and methods of physics, and to cultivate students' ability to analyze and solve problems; This course enables students to correctly understand the concepts and laws of physics, correctly understand the establishment and development process of basic theories of physics, cultivate students' correct thinking methods and research methods, and give full play to the role of this course in cultivating students' dialectical materialist world view. At the same time, it cultivates students with high scientific quality, and lays the necessary physical foundation for students to learn professional knowledge and modern science and technology.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the teaching of this course, students will master the basic knowledge and have certain application

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ability, and the specific objectives of the course are as follows:

Course Objective 1. Master the physical quantities that describe the motion and motion changes of the particle such as vector, displacement, velocity, acceleration, angular velocity and angular acceleration, distinguish the concepts of moment and time interval, displacement and distance, and distinguish between average and instantaneous, scalar and vector;

Course Objective 2. understand the physical significance of tangential and normal acceleration; Understand the significance of the equation of motion, and preliminarily master the method of finding displacement, velocity and acceleration from the equation of motion, and deriving the equation of motion from the known velocity and acceleration;

Course Objective 3. Master Newton's three laws and their applicable conditions, and be able to correctly use them to solve particle motion problems; Master the isolator method, and skillfully use Newton's laws to solve related mechanical problems;

Course Objective 4. Understand the definition of work, master the method of calculating the work done by variable force, understand the characteristics of work done by conservative force and the concept of potential energy; Understand and apply the kinetic energy theorem, master the content and applicable conditions of the mechanical energy law, and use it to solve related mechanical problems; Understand the concept of momentum and impulse, understand the principle of momentum, grasp the content and applicable conditions of the law of conservation of momentum, and use it to solve related collision problems;

Course Objective 5. Master the translation and rotation of rigid bodies and rigid bodies, the fixed axis rotation of rigid bodies, the angular momentum, rotational kinetic energy, moment of inertia of rigid bodies, the laws of moment, the laws of rotation, the work of moments, the kinetic energy theorems of rotation, the angular momentum theorem and the law of conservation of angular momentum of rigid bodies;

Course Objective 6. Master the concept of simple harmonic vibration, simple harmonic vibration equation, amplitude, period, frequency, circular frequency, phase, rotation vector method; Master the energy and characteristics of simple harmonic vibration; Master the synthesis of simple harmonic vibration: the synthesis of harmonic vibration of the same direction and the same frequency, and the synthesis of harmonic vibration of different frequencies in the same direction; Understand dampened vibrations, forced vibrations, resonances;

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Course Objective 7. Master the generation and propagation of mechanical waves in elastic media, longitudinal and transverse waves, wave velocity, frequency, wavelength and their relationships; master the wave equation of plane simple harmonics; master the energy, energy flow and energy flow density of mechanical waves;

Course Objective 8. Master Huygens' principle, the superposition principle of waves, diffraction, the superposition principle of waves, the phase difference, the interference of waves, and standing waves; understand the Doppler effect;

Course Objective 9. Understand the basic concepts of the theory of motion of gas molecules, the state parameters of gases, equilibrium states and equilibrium processes; Master the equation of state of an ideal gas, the pressure formula and temperature formula of an ideal gas and its statistical significance; Master the theorem of equal division of energy in degrees of freedom, the internal energy of an ideal gas; Master Maxwell's rate distribution, average rate, root mean square rate, and maximum rate; Grasp the average collision frequency and average free path of gases; understand the internal energy, work, and heat of the system;

Course Objective 10. Master the first law of thermodynamics and its application to the four quasi-static processes of ideal gas isotomicity, isobaric, isothermal and adiabatic, and the molar heat capacity of gas; Master the cycle process, Carnot cycle, Carnot's theorem, heat engine efficiency; Understand the physical significance of the second law of thermodynamics, reversible and irreversible processes, the statistical significance of the second law of thermodynamics, entropy;

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

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3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wan Zhuo Department (Office) Director Review: Zhang Saiwen College Leader Review: Tan Weishi

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University Physics (2) Syllabus

Course name	University Physics (2)	Course number	9065112021						
English name	University Physics (2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Lessons <input type="checkbox"/> Subject Fundamentals <input checked="" type="checkbox"/> Major Core Courses (Elective <input type="checkbox"/> Compulsory <input type="checkbox"/> Self-Development Courses (Compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	48	Credits	3.0	Theoretical hours	48	Practical hours	0	Computer-based hours	0
Prerequisites	Further Mathematics								
Teaching materials and reference materials	Course textbook: College Physics (1st Edition), edited by Yao Yingbo, Harbin Institute of Technology Press References: Cheng Shouzhu, "General Physics", etc								

One. Course Description:

College Physics (2) is the study of the most universal and basic forms of motion in the material world and their laws. It is the foundation of many natural sciences and engineering technologies. For higher engineering majors, College Physics is an important compulsory basic course, which is closely related to many basic courses and technical basic courses.

Through the study of this course, students will have a comprehensive and systematic understanding of the basic concepts, basic principles and basic laws of physics, understand the relationship between various forms of motion, and have a general understanding of the modern development and new achievements of physics. To enable students to receive preliminary and rigorous training in scientific experiment ability, calculation ability and abstract thinking ability; To familiarize students with the basic ideas and methods of physics, and to cultivate students' ability to analyze and solve problems; To play the role of this course in cultivating students' dialectical materialist worldview. At the same time, it cultivates students with high scientific quality, and lays the necessary physical foundation for students to learn professional knowledge and modern science and technology. The teaching objectives of the course and the graduation requirements underpinned by it

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the study of this course, students should understand the meaning of electric field, magnetic field, and electromagnetic induction basic physical quantities; Understand and master the basic theorems, laws and fundamental analysis methods; Understand and master Gauss's theorem and Ampere's loop theorem and their applications.

Course Objective 2: Through the study of this course, understand the monochromacy and coherence of light sources Two methods to obtain coherent light, be able to quantitatively calculate, analyze and determine Young's double-slit interference, thin film interference, splitting the tip stem involving the position of the interference fringes of Newton's rings, and master Marius's law and Bruster's law understand the half-wave band method; Master the calculation of diffraction and dark grain position of single seam Fulanghefei; Able to analyze the influence of slit width and wavelength on diffraction fringes, and master the grating formula; The position of the grating diffraction line and the order of the missing order will be determined; The influence of grating constant and

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wavelength on the distribution of grating diffraction lines will be analyzed, and the Ruili criterion will be understood. Understand the effect of light diffraction on the resolving ability of optical instruments

Course Objective 3: To guide students to learn knowledge, understand principles, and master laws more realistically, and improve students' engineering practice and innovation ability by starting from the relationship between physics and water supply and drainage science and engineering, and the needs of scientific research and production.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Xu Zhifeng, Director of the Department (Office) Review: Zhang Saiwen, College Leader Review: Tan Weishi

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University Physics Laboratory Syllabus

Course name	University Physics Experiments	Course number	9065212030						
English name	Physics experiments								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Courses <input type="checkbox"/> , Basic Courses <input checked="" type="checkbox"/> , Major Core Courses (Elective <input type="checkbox"/> Compulsory <input type="checkbox"/>), Self-Directed Development Courses (Compulsory <input type="checkbox"/> , Elective <input type="checkbox"/>) , and Intensive Practice Courses <input type="checkbox"/>								
Offering unit	Faculty of Information and Electronic Engineering								
Total credit hours	16	Credits	0.5	Theoretical hours	0	Practical hours	16	Computer-based hours	0
Prerequisites	College Physics								
Teaching materials and reference materials	University Physics Experiments, Xu Zhifeng, Beijing University of Posts and Telecommunications Press								

1. Course Introduction

"College Physics Experiment" is an independent compulsory course for college students to carry out basic training in science experiments. It plays an irreplaceable role in cultivating the practical ability and knowledge of college students. Its purpose is to deepen students' understanding of the basic principles of university physics and to develop students' initial ability to design and organize physics experiment schemes. To cultivate students' general skills in conducting experiments and the basic ability to use experimental instruments and equipment; Cultivate students' basic ability to analyze and process experimental data. Lay the necessary foundation for lifelong learning and further development of students. This course is one of the six key courses established by the former State Education Commission.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To enable students to start conducting physics experiments by reading experimental textbooks or materials.

Course Objective 2: To enable students to use commonly used instruments correctly with the help of textbooks or instrument manuals.

Course Objective 3: To enable students to use physical theories to qualitatively and quantitatively judge the accuracy of results and study physical laws.

(2) Teaching methods

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On the basis of middle school physics experiments, students can learn the knowledge and methods of physics experiments in accordance with the principle of step-by-step, and get the training of experimental skills, so as to have a preliminary understanding of the main process and basic methods of learning experiments, and lay a good foundation for further study in the future.

1. Observe the phenomena of physical experiments through experimental videos, and cultivate students' preliminary ability to analyze and solve problems.

2. Cultivate students' scientific experiment ability:

(1) Prepare for the experiment by reading the experimental reference textbook and comparing the actual objects.

(2) By reading the relevant instrument information, you can use the commonly used instrument correctly.

(3) Correctly record and process experimental data, and prepare qualified experimental reports.

(4) Cultivate students' scientific and technological writing ability and language expression ability through the preparation of experimental reports.

3. Cultivate students' rigorous academic attitude and scientific style of seeking truth from facts.

Formulated by: Deng Taiping Director of the Department (Office) Review: Zhang Saiwen College Leader
Review: Tan Weishi

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Engineering Drawing Syllabus

Course name	Engineering Drawing	Course number	9112112111						
English name	Engineering Drawing								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Lessons <input type="checkbox"/> Subject Fundamentals <input checked="" type="checkbox"/> Major Core Courses (Elective <input type="checkbox"/> Compulsory <input type="checkbox"/> Self-Development Courses (Compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Faculty of Mechanical and Electrical Engineering								
Total credit hours	40	Credits	2.5	Theoretical hours	40	Practical hours	0	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	Course textbook: Civil Engineering Graphics (Fifth Edition) edited by Yuan Guo and Hu Qingchun, Hunan University Press References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Engineering Drawing is a basic course for water supply and drainage science and engineering. Through this course, students will study the theories and methods of drawing and reading engineering drawings, develop students' drafting skills and spatial imagination, and also lay the necessary foundation for students to study subsequent courses and complete course design and graduation projects. Engineering drawings are an important tool for expressing and communicating technical ideas and an important technical document for engineering and technology departments, as well as indispensable technical data for guiding production and construction management. Water supply and drainage and other engineering construction are designed first, draw drawings, and then according to the drawings of construction, so civil engineering and construction engineering and technical personnel, must be able to skillfully draw and read the engineering drawings of the major, so in the teaching plan of water supply and drainage science and engineering, the main technical basic course of engineering drawing must be opened.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To cultivate the ability to read and draw engineering drawings of the major through course learning; Cultivate engineering awareness, implement and implement national standards.

Course Objective 2: To develop spatial imagination and lay a solid foundation for developing analytical, problem-solving, creative and aesthetic skills.

Course Objective 3: Develop initial skills in computer graphics.

Course Objective 4: To cultivate a conscientious and responsible work attitude and a rigorous, realistic, and meticulous work style.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

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Each chapter is equipped with corresponding exercises, including reflection questions, quiz questions and drawing questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhang Wenfang, Director of the Department (Office) Review: Zhang Wenfang College Leader

Review: Zhou Li

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General Chemistry Syllabus

Course name	General Chemistry				Course number	9080112020			
English name	General Chemistry								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	2.0	Theoretical hours	24	Practical hours	8	Computer-based hours	0
Prerequisites									
Teaching materials and reference materials	Course Textbook: General Chemistry Teaching and Research Group, Zhejiang University. General Chemistry[M]. Beijing: Higher Education Press, 2011.06 (6th Edition). Reference: Gao Song, General Chemistry, Peking University Press, 201308 教学网站: https://www.bilibili.com/video/av8360097/								

1、 Course Description:

General Chemistry is an indispensable basic knowledge structure course for non-chemical engineering science and engineering majors, which plays a very important role in the follow-up course study and future development of the major. This course is suitable for resource exploration engineering, exploration technology and engineering (exploration technology, hydraulic engineering), gem and material technology, environmental engineering, environmental science, water supply and drainage engineering, hydrology and water resources engineering, resource environment and urban and rural planning management, civil engineering, etc. Through the theoretical basis of the structure of matter, chemical kinetics, the basic laws of chemical reactions and the engineering practice of important elements and compounds, new technologies. Learn basic knowledge such as new materials and chemical experiments. It enables students to understand the basic theories of modern chemistry, have the necessary basic knowledge and certain basic skills, provide the necessary chemical foundation for future study and work, be able to observe the phenomenon of material change from the perspective of chemistry in engineering technology, and have the ability to preliminarily analyze and solve some practical problems related to chemistry-related engineering technology. Cultivate students' correct learning and research methods, and gradually establish a dialectical materialist world view.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Course Objective 1: To acquire knowledge of the interrelated chemistry and physics to lay the foundation for solving complex engineering problems in the field of water supply and drainage science and engineering; Through the course study, students will master the relationship between chemistry and physics, use physics methods to solve chemical problems, understand the relationship between chemistry and water supply and drainage science and engineering, physics and other majors, understand the knowledge context structure system of this major, and be able to apply it to solve complex engineering problems.

Course Objective 2: Master the principles of natural sciences such as chemistry, mathematics, and university physics, and have the ability to identify and express key aspects of complex engineering problems; Familiar with the relationship between chemistry and physics, learn to use the methods of physics to study chemical problems, combine the principles and research methods of physical chemistry, provide a basis for the selection of water supply system, drainage system, fire protection system, etc., and have the ability to

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systematically analyze complex building water supply and drainage problems with the help of literature retrieval, data review and other means, and put forward corresponding solutions and theoretical basis.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Meng Wei Department (Office) Director Review: Wang Feng College Leader Review: He Guowen

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Syllabus of Introduction to Water Supply and Drainage Science and Engineering

Course name	Introduction to Water Supply and Drainage Science and Engineering	Course number	9021112010						
English name	Introduction to Water and Wastewater Science and Engineering								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> basic courses <input checked="" type="checkbox"/> Major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-directed development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	16	Credits	1.0	Theoretical hours	16	Practical hours	0	Computer-based hours	0
Prerequisites	not								
Teaching materials and reference materials	Course Textbook: Introduction to Water Supply and Drainage Science and Engineering (2nd Edition); Li Guibai, Jiang Zhanpeng, Fan Jinchu, Long Tengrui, editors-in-chief; China Architecture & Building Press; 2010.3. References: design specifications, related teaching materials, etc								

1、 Course Description:

Introduction of Water and Wastewater Science and Engineering is an introductory course for water supply and wastewater science and engineering. Its purpose and mission is to provide a general introduction to the main professional knowledge of the discipline. The course includes the relationship between the social cycle of water and the major, the relationship between the discipline of water engineering and related disciplines, the utilization and protection of water resources, pipeline engineering systems, water treatment engineering, building water supply and drainage engineering, water engineering construction and economy, water engineering equipment and automatic control, etc. Through the study of this course, students have a general understanding of the severe situation of China's water resources crisis, a basic understanding of the main content of this discipline, a macro understanding of the basic theories, related disciplines, modern science and technology required by the major, improve their interest in learning, enhance their confidence in learning, learning purpose and determination to devote themselves to the cause of water supply and drainage science and engineering.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be familiar with the basic concepts, basic theories and basic methods related to water supply and drainage science and engineering, and to cultivate students' engineering professional ethics and social responsibility in the process.

Course Objective 2: To apply the basic theories and methods of water supply and drainage science and engineering to simple engineering practical problems, and stimulate students' awareness of self-directed learning and lifelong learning.

Course Objective 3: To understand the composition of the water supply and drainage science and engineering discipline system and the interdisciplinary relationships involved.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

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It is mainly lectured in the classroom, interspersed with some examples of animation and engineering applications in the teaching process, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Assign corresponding exercises, including reflection questions and question and answer questions, to deepen understanding and grasp the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Class discussions

Arrange necessary class discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhou Jun, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

Attachment B-12: All course outlines for the Water Supply and Drainage major**Physical Chemistry Syllabus**

Course name	physical chemistry				Course number	9080112301			
English name	physical chemistry								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> basic courses <input checked="" type="checkbox"/> Major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-directed development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	School of Materials and Chemical Engineering								
Total credit hours	32	Credits	2.0	Theoretical hours	28	Practical hours	4	Computer-based hours	0
Prerequisites	General Chemistry, Organic Chemistry, Introduction to Water Supply and Drainage Science and Engineering, General Physics, Advanced Mathematics								
Teaching materials and reference materials	Course textbook: Yin Yongjia, Xi Zhengkai and Zhang Shuyuan, eds., A Concise Course of Physical Chemistry (Fourth Edition), University Press								

1、 Course Description:

Physical Chemistry is a basic course of water supply and drainage science and engineering, and is the earliest interpenetrating marginal discipline of physics and chemistry, and is the theoretical basis of chemistry and chemical engineering, materials, biology, medicine, building water supply and drainage engineering and other disciplines. The soul of chemistry". This course plays an extremely important role in cultivating students' creative ability and improving their quality. The purpose of physical chemistry is to further study the general laws of the chemical motion of matter by applying the relevant theories and methods of physics and mathematics on the basis of the previous courses already learned. Only by learning physical chemistry can we understand chemical movements in essence, explain chemical phenomena theoretically, and master chemical knowledge more systematically and profoundly. Therefore, physical chemistry plays an extremely important role in improving students' chemistry level.

The main task of this course is to cultivate students' basic ability to engage in the design ability of building water supply and drainage engineering and improve the basic ability of this technology. Through the study of this course, students will be equipped with solid basic theories and professional knowledge, be able to quickly adapt to the new needs of emerging industries in the future, cultivate students' ability to analyze and solve various problems in chemistry and related disciplines, and establish a good spirit of collaboration, and establish the idea of dialectical materialism. It is helpful to further consolidate the theoretical foundation of learning related professional courses, strengthen students' awareness of independent learning and lifelong learning, and improve their practical ability and innovative thinking.

The purpose of this course is to further study the general laws of the chemical motion forms of matter by applying the relevant theories and methods of physics and mathematics on the basis of some previous courses. In the syllabus, the principle of linking theory with practice is less and more refined, so that students can understand and master the basic theories of physical chemistry, so as to enhance their ability to analyze and solve problems in teaching and scientific research.

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The theoretical content of this course includes three chapters: the first law of thermodynamics, the second law of thermodynamics, and chemical potential. In order to cultivate students' ability to work independently and strengthen professional quality education, the teaching content should be clearly prioritized, and the key and difficult points of the teaching materials should be explained under the principle of paying attention to systematization. Exercises are an important part of teaching and learning that teachers must pay attention to.

Physical and chemical experiments The teaching content of this course is: viscosity method to determine the relative molecular weight of water-soluble polymers, galvanic cell electromotive force determination and application (choose one of the two).

2、The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To acquire relevant knowledge of chemistry and physics that are interrelated and to lay the foundation for solving complex engineering problems in the field of water supply and drainage science and engineering; Through the course study, students will master the relationship between chemistry and physics, use physics methods to solve chemical problems, understand the relationship between chemistry and water supply and drainage science and engineering, physics and other majors, understand the knowledge context structure system of this major, and be able to apply it to solve complex engineering problems.

Course Objective 2: Master the principles of natural sciences such as chemistry, mathematics, and university physics, and have the ability to identify and express the key aspects of complex engineering problems; Familiar with the relationship between chemistry and physics, learn to use the methods of physics to study chemical problems, combine the principles and research methods of physical chemistry, provide a basis for the selection of water supply system, drainage system, fire protection system, etc., and have the ability to systematically analyze complex building water supply and drainage problems with the help of literature retrieval, data review and other means, and put forward corresponding solutions and theoretical basis.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and self-study is to learn the corresponding teaching content of this course online in the school, and at the same time arrange questions after class.

2. Exercises and exercises

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Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

4. Online teaching

With the help of the online teaching platform, the learning effect is investigated in the form of rain classroom assignments and unit exams

Formulated by: Long Liping, Director of the Department (Office) Review: Wang Feng College Leader Review: He Guowen

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Organic Chemistry Syllabus

Course name	organic chemistry	Course number	9080112200						
English name	organic chemistry								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> basic courses <input checked="" type="checkbox"/> Major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-directed development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/>) , and intensive practical courses <input type="checkbox"/>								
Offering unit	School of Materials and Chemical Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	20	Practical hours	4	Computer-based hours	0
Prerequisites	General Chemistry, Introduction to Water Supply and Drainage Science and Engineering, etc								
Textbook-level references	Course Textbook: Organic Chemistry (Fifth Edition), Zhang Wenqin, Department of Organic Chemistry, Tianjin University, Higher Education Press References: Organic compound data sheets, references, etc								

1、 Course Description:

The organic chemistry course is a basic course for biotechnology, materials, chemical engineering, environmental science and engineering, water supply and drainage science and engineering, etc. Organic chemistry is the science that studies the source, structure, properties, preparation and application of organic compounds, as well as the theory and methodology. Through the study of this course, students will have a systematic and comprehensive understanding of the content of organic chemistry, understand the relationship between the structure and properties of organic compounds, be familiar with the mutual transformation of various organic substances and their laws, and generally understand the major new scientific and technological achievements of this discipline at home and abroad. It enables students to firmly grasp the basic knowledge, basic theories and basic skills of organic chemistry, cultivate students' dialectical materialist viewpoint and adhere to the principle of integrating theory with practice, and cultivate students' ability to analyze and solve problems. It lays a solid foundation for cultivating and cultivating high-level and compound engineering and technical talents in biotechnology, materials, chemical engineering, environmental engineering, water supply and drainage science and engineering, etc.

2. The teaching objectives of the course and the graduation requirements supported by it

1、 Course Teaching Objectives

Through the theoretical and practical teaching of this course, students will be equipped with the following abilities:

Course Objective 1: To enable students to master the structure of organic chemistry, the basic theory of reaction and the method of organic synthesis, understand the relationship between chemistry and water supply and drainage science and engineering, and lay a solid foundation for further acquisition of organic chemistry knowledge and subsequent professional basic courses and professional courses.

Course Objective 2: Guided by the theory of organic chemistry, students will be trained to generalize, logical reasoning, self-learning, independent thinking and innovation, and provide a theoretical basis for the design of water supply and drainage systems in water supply and drainage science and engineering, so that students can comprehensively use the principles and methods of organic chemistry to analyze and solve practical application problems.

(2) Teaching methods

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1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is assigned corresponding exercises, including reactive, recommended, discriminative and synthetic questions, to deepen their understanding and grasp of the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Qi Fengpei, Director of the Department (Office) Review: Wang Feng College Leader Review:
Zhang Saiwen

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Syllabus of Electrical and Electronic Studies

Course name	Electronics	Course number	9061312300						
English name	Electrical Engineering and Electronics								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> basic courses <input checked="" type="checkbox"/> Major Core Courses (Elective <input type="checkbox"/> Compulsory <input type="checkbox"/> Self-Development Courses (Compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	Faculty of Information and Electronic Engineering								
Total credit hours	32	Credits	2,0	Theoretical hours	28	Practical hours	4	Computer-based hours	0
Prerequisites	University Physics, Advanced Mathematics, etc								
Teaching materials and reference materials	Course textbook: "Concise Course of Electrical Engineering" (3rd Edition), edited by Qin Zenghuang, Higher Education Press Reference: Fundamentals of Electronic Technology, edited by Kang Huaguang, Higher Education Press, Industrial Press Fundamentals of Analog Electronic Technology, edited by Gu Lei and Zhang Xuejun, University of Electronic Science and Technology of China Press.								

1、 Course Description:

"Electrical and Electronic Technology" is a basic technical course for students majoring in non-electrical engineering, which connects electrical technology and electronic technology, and focuses on the introduction of basic concepts and applications of electrical and electronic technology. The course content mainly includes circuits and circuit components, circuit analysis basics, discrete component basic circuits, digital integrated circuits, integrated operational amplifiers, waveform generation and transformation, measurement and data acquisition systems, power electronic circuits, electrical control technology, etc. Lay a certain foundation for studying follow-up courses or engaging in engineering and technical work related to the major.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching of this course, students will be equipped with the following abilities:

Course Objective 1: Through the course learning, students should understand the meaning of circuit models and basic physical quantities; Understand and master the basic theorems, laws and fundamental analysis methods; Understand and master the phasor representation of sinusoidal alternating current and phasor analysis methods in circuits.

Course Objective 2: Through the course learning, students should understand the working principle and performance characteristics of the co-shot single-tube amplifier circuit and emitter output; Master the methods of dynamic and static analysis of common emitter single-tube amplifier circuits, emitter outputs and resistor-capacitance coupled multistage amplifier circuits composed of them; Master the use of ideal operational amplifiers in signal operation; Master the analysis methods of single-phase rectification, capacitor filtering, and integrated voltage regulation circuits.

Course Objective 3: Master the analysis and design methods of simple combinatorial logic circuits; Ability to analyze simple sequential logic circuits.

Course Objective 4: Through the connection between electrical engineering and electronics, water supply and drainage science and engineering, and the needs of scientific research and production, students will be guided

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to learn knowledge, understand principles, and master laws more realistically, so as to improve students' engineering practice and innovation ability.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhang Xuejun, Director of the Department (Office) Review: Hu Saichun, College Leader Review:
Cao Buwen

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Engineering Mechanics Syllabus

Course name	Engineering mechanics	Course number	9034112101						
English name	<u>Engineering mechanics</u>								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> basic courses <input checked="" type="checkbox"/> Major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-directed development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	Faculty of Civil Engineering								
Total credit hours	40	Credits	2.5	Theoretical hours	40	Practical hours	0	Computer-based hours	0
Prerequisites	Advanced Mathematics, University Physics								
Teaching materials and reference materials	Course textbook: Building Mechanics (2nd Edition), edited by Li Yongsuo and Guo Jian, Wuhan University of Technology Press Reference: Engineering Mechanics (3rd Edition), edited by Fan Qinshan, Tsinghua University Press								

1、 Course Description:

Engineering Mechanics is a basic course of water supply and drainage science and engineering, which is an engineering discipline that studies the basic problems of force balance, internal force, strength, stiffness and stability of building (structure) components. The strength, stiffness and stability of the whole building (structure) and its components are the most critical and basic issues to ensure their safe use, which directly affects the living conditions of the occupants in the building and the people engaged in various activities, the work effectiveness and the safety of life and property, and also affects the rationality of the project cost. The purpose of the course teaching is to understand the status and role of engineering mechanics in engineering construction. Master the basic concepts of internal force, strength, stiffness, stability and other components, and have a preliminary understanding of the basic principles, basic theories and basic methods of theoretical mechanics (statics) and material mechanics. Understand the significance and basic methods of abstracting practical problems in engineering practice into mechanical models, and understand the application of the basic forms of rod structures (models) in engineering practice.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching of this course, students are equipped with basic knowledge and abilities, and

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the specific course objectives of the course are as follows:

Course Objective 1. Through the course study, students can understand the research tasks and learning methods of engineering mechanics, the relationship between engineering mechanics and other courses, and understand the knowledge system of engineering mechanics courses and the course requirements for water supply and drainage majors.

Course Objective 2. understand the basic assumptions of deformable solids; Master the basic concepts of strength, stiffness, and stability. Master the force analysis of plane force system problems, and master the simplified basis equilibrium calculation of plane intersection force system, force couple system and arbitrary force system. Master the calculation of support reactions for simple member structures, and have a preliminary understanding of the problem of space force system.

Course Objective 3. Understand the concepts and characteristics of common basic deformations of members. Master the concept of internal forces under the basic deformation of members, the calculation of internal forces by the cross-section method and other methods, and the drawing method of internal force diagrams. Master the stress-strength and deformation-stiffness calculations of the basic deformation of members; Master the concepts of Hooke's law, modulus of elasticity, and Poisson's ratio; Master the tensile and compressive properties of members of different materials, and the establishment and calculation of strength conditions. Understand the stress concentration and stress distribution characteristics of oblique sections.

Course Objective 4. The static equilibrium equation is used to solve the support reaction force of engineering components; The internal force and stress distribution problems of simple tension and compression rods and plane bending rods in engineering examples are analyzed to solve the simple strength problems.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate

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students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Jiang Lei, Director of the Department (Office) Review: He Ye College Leader Review: Wang Xinzhong

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Hydraulics syllabus

Course name	hydraulics	Course number	9021312021						
English name	hydraulics								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	56	Credits	3.0	Theoretical hours	40	Practical hours	16	Computer-based hours	0
Prerequisites	Advanced Mathematics, Engineering Mechanics								
teaching materials	Course textbook: Zhang Weijia, Editor-in-Chief, Hydraulics (Second Edition), China Architecture & Building Press, 2015								

1、 Course Description:

Hydraulics is a major basic course in water supply and drainage science and engineering, whose main task is to enable students to master the general laws of water flow movement and the basic concepts, basic theories, basic methods of hydraulic calculation and basic experimental skills related to it. Through the study of this course, students will master the methods of analyzing hydraulic problems, cultivate the ability to solve related engineering problems, and lay the foundation for studying follow-up professional courses, engaging in professional and technical work, exploring new technical fields and conducting scientific research.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To cultivate students' ability to apply the basic concepts and principles of hydraulics to solve related engineering problems, and to establish a good sense of professional ethics and social responsibility;

Course Objective 2: Master the basic principles of hydraulics, analyze and identify complex engineering problems in the major, be able to use literature and materials, and initially have the ability to accurately express, analyze and solve practical engineering problems;

Course Objective 3: Be familiar with the operation methods of hydraulics-related experimental instruments and equipment, write hydraulic experiment reports, clearly express personal opinions, and have the awareness and skills to carry out experimental research around solving complex hydraulic engineering problems and the preliminary ability of engineering communication and exchange.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are

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arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Li Yuanping, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Water Analytical Chemistry Syllabus

Course name	Water Analytical Chemistry	Course number	9021312031						
English name	Water Analytical Chemistry								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	40	Credits	2,0	Theoretical hours	24	Practical hours	16	Computer-based hours	0
Prerequisites	General Chemistry, Organic Chemistry, Physical Chemistry, etc								
Teaching materials and reference materials	Course textbook: Water Analytical Chemistry (Fourth Edition) edited by Huang Junli and Wu Mingsong, China Architecture & Building Press References: relevant standards, norms, manuals, teaching materials, etc								

1、 Course Description:

Water Analytic Chemistry is a major professional foundation course in water supply and drainage science and engineering. It is also one of the ten backbone courses developed by the Professional Steering Committee. It is a discipline that studies the composition, properties, and content of water and its impurities, contaminants, and their methods of analysis. The purpose and task of this course is to enable students to establish an accurate concept of "quantity", and to make correct judgments and evaluations on water supply and drainage engineering design, water treatment process, water environment quality evaluation and comprehensive utilization effect of wastewater. Through the course teaching, students will master the basic principles, basic knowledge, basic theories and basic skills of the four major titration methods of water analytical chemistry (acid-base titration, coordination titration, precipitation titration and redox titration) and the main instrumental analysis (such as: absorption spectrometry, gas chromatography and atomic absorption method, etc.). Through experimental teaching, students can correctly grasp the basic operation of water analytical chemistry. The whole teaching process should pay attention to cultivating students' rigorous scientific attitude and cultivating students' ability to analyze and solve problems independently. Through the study of this course, students will cultivate their water quality engineering analysis skills, and lay a certain foundation for the study of related professional courses, graduation links and future production and scientific research work.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To master the knowledge of water analytical chemistry through the course learning, and use it to solve complex engineering problems in the major, and establish students' good professional ethics and sense of social responsibility.

Course Objective 2: To be able to apply the basic theories and basic analysis methods of water analytical chemistry, obtain engineering survey information, analyze related problems, and propose effective solutions to problems.

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Course Objective 3: To be familiar with the operation methods of experimental instruments and equipment related to water analytical chemistry, and to have the awareness and skills to carry out experimental research around solving complex problems in water analytical chemistry.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Li Guohui, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Basic syllabus of civil engineering

Course name	Civil engineering foundations				Course number	9032112240			
English name	Introduction to Civil Engineering								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	Engineering Drawing, Theoretical Mechanics, Computer Fundamentals, etc								
Teaching materials and reference materials	Course textbook: Introduction to Civil Engineering from Duan Shujin to Zhongfu (2nd Edition)[M]. Chongqing University Press, 2018.05 References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Introduction of Civil engineering It is a compulsory course for the four-year undergraduate engineering foundation of water supply and drainage science and engineering. According to the latest technical standards and specifications of civil engineering in China, the history, current situation, achievements and development trends of civil engineering at home and abroad are introduced. This course is mainly familiar with the basic knowledge of the structure, classification, and characteristics of various civil engineering facilities, and understands the responsibilities and obligations of civil engineers. The course content includes introduction, responsibilities and obligations of civil engineers, civil engineering materials, foundation engineering, geotechnical and underground construction, construction engineering, road engineering, bridge engineering, rail transit engineering, tunnel engineering, hydraulic structures, port engineering structures, disaster prevention and mitigation of civil engineering, and sustainable development of civil engineering.

Through the study of this course, students can understand the civil engineering major from ignorance to understanding, and finally love the major, so that students can understand the status and role of civil engineering, understand the training objectives and teaching content of civil engineering, establish a correct learning concept and engineering awareness, and lay a good ideological and methodological foundation for future study in school and stimulate their learning potential.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Through the theoretical teaching of this course, students are equipped with basic knowledge and abilities, and the specific course objectives of the course are as follows:

Course Objective 1: To familiarize yourself with the history, development, status and role of the civil engineering profession.

Course Objective 2: Responsibilities and Obligations of Civil Engineers.

Course Objective 3: To be familiar with the concepts, classification, composition and characteristics of construction engineering, bridge engineering, road engineering and rail transit engineering, and to understand the

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classification, composition and characteristics of tunnel engineering, hydraulic engineering structures and port engineering structures.

Course Objective 4: Understand the basic methods, procedures and organizational design of civil engineering construction.

Course Objective 5: Understand the main types of disaster mitigation and prevention in civil engineering.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: He Ran/Cai Jingyao Department (Office) Director Review: He Ran College Leader Review: Wang Xinzhong

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Syllabus of Hydrology and Hydrogeology

Course name	Hydrology and Hydrogeology			Course number	9036112180				
English name	Hydrology and hydrogeology								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Civil Engineering								
Total credit hours	32	Credits	2.0	Theoretical hours	32	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, civil engineering foundations, etc								
Teaching materials and reference materials	Course textbook: Wang Xiaoling, Han Bing, Song Tiehong, eds., Hydrology and Hydrogeology, China Architecture & Building Press, 2015 References: design manuals, specifications, related textbooks, etc								

1. Course Introduction

Hydrology and Hydrogeology is a compulsory course for water supply and drainage science and engineering, through the study of this course, students can master the basic principles of hydrology and learn the basic methods of hydrological analysis and calculation. Master the basic geological concepts, the physical and chemical properties and characteristics of groundwater, the basic characteristics of the occurrence and evolution of groundwater, and the preliminary knowledge of the selection and design of general groundwater supply sources.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Teaching Objective 1: To master the basic principles and basic computing skills of hydrology through the course learning, and be able to use them to solve complex engineering problems in the major, and enhance students' sense of social responsibility.

Teaching Objective 2: Through the course learning, understand the analysis and calculation methods of sufficient, insufficient and lack of data, master the basic principles and basic calculation skills of hydrology, and be able to identify the hydrological engineering problems of the major, and be able to use engineering language such as drawings, diagrams and technical reports to accurately express them.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

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3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Li Zhiping, Director of the Department (Office) Review: Ji Wei College Leader Review: Wang Xinzhong

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Pumps & Pumping Station Syllabus

Course name	Pumps & Pumping Stations				Course number	9021312041			
English name	Pumps and pumping stations								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	2	Theoretical hours	28	Practical hours	4	Computer-based hours	0
Prerequisites	Hydraulics, Engineering Drawing, Civil Engineering Fundamentals								
Teaching materials and teaching resources	Course Materials: Zhang Wei, Zhou Shukui. Beijing:Peking University Press,2014 References: relevant standards, specifications, design manuals, etc								

1、 Course Description:

"Pumps and Pumping Stations" is one of the important professional basic courses of water supply and drainage science and engineering. The course task is to make students familiar with the basic structure, working principle and main performance parameters of pumps commonly used in water supply and drainage engineering; Master the basic equation of the pump and its characteristic curve; Master the determination of pump working conditions and the principle and method of working condition adjustment; Master the selection of water pumps and the determination of their parallel series operation conditions; Master the basic knowledge, process and method of process design of water supply and drainage pumping station; Understand the basic knowledge of pump station operation management, unit use and maintenance, etc.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course objective 1: Master the basic structure, working principle, basic performance parameters and characteristic curves of pumps commonly used in water supply and drainage engineering, and master the numerical and graphical solutions and working conditions adjustment principles and methods of pump constant speed operation conditions.

Course objective 2: Master the process characteristics and basic design calculation methods of water supply pumping stations and drainage pumping stations, solve problems such as pump selection, pipeline system and its ancillary design in the process design of pumping stations, and have the ability to use relevant standards, specifications and design manuals to complete the process design of pumping stations. Establish good life values, social professional ethics and a sense of responsibility, so that students have good engineering ethics.

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Course Objective 3: Be able to use basic knowledge and basic theories to draw characteristic curves and pump operation and maintenance, and have certain ability of pumping station operation management and pumping station operation scheduling.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Experiment

Cooperate with classroom teaching, organize corresponding experiments, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wang Cai, Director of the Department of Literature (Office) Review: Wang Aihe College Leader

Review: Li Yongsuo

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Syllabus of Biology of Water Treatment

Course name	Biology of water treatment	Course number	9021312051						
English name	Biology of water treatment								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses, <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	48	Credits	2.5	Theoretical hours	32	Practical hours	16	Computer-based hours	0
Prerequisites	General Chemistry, Organic Chemistry, Water Analytical Chemistry, etc								
Teaching materials and reference materials	Course textbook: Biology of Water Treatment (6th Edition), edited by Gu Xiasheng, Hu Hongying, et al., China Architecture & Building Press, 2018 Reference: Microbiology of Environmental Engineering (Fourth Edition) edited by Zhou Qunying and Wang Shifen, Higher Education Press, 2015. Experiments in Microbiology of Water Treatment (2nd Edition), edited by Wang Jialing, Beijing: Higher Education Press, 2004.								

1、 Course Description:

Biology for Water Treatment is a compulsory basic course for water supply and drainage science and engineering. In the context of water treatment engineering, students are required to have an in-depth grasp of the basic knowledge of microorganisms and the application of microbial principles in water pollution control and water supply, so as to provide microbial theory and experimental basis for learning environmental pollution control and drainage engineering. Through the theoretical and experimental teaching of the course "Microbiology of Water Treatment", students will master the basic concepts, basic theories and applications of water treatment biology, master the research methods and basic operation skills of microbiology, cultivate the ability of theoretical analysis, innovative thinking and practical problem solving, and lay the necessary biological foundation for the study of various professional courses in the future.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be familiar with the morphology and structure of bacteria, to master their physiological characteristics, growth and genetic variation, to cultivate students' realistic and pragmatic scientific research spirit, and to establish good professional ethics and ethical concepts.

Course Objective 2: To cultivate students' professional quality, guide students to master the characteristics of viruses (bacteriophages), filamentous bacteria and eukaryotic microorganisms, and be familiar with common microorganisms and their roles in water treatment.

Course objective 3: Master the characteristics and control methods of pathogenic microorganisms in water, master coliform bacteria and their determination methods, cultivate students' ability to use scientific methods to solve problems, and establish awareness of water ecological health and safety.

Course Objective 4: To cultivate students' sense of social mission, so that students can understand the role of this course in environmental protection, society and health, master the mechanism of microorganisms in the degradation and transformation of pollutants, master the microbial degradation pathways of t

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typical organic matter and the biotransformation process of inorganic elements, and master the typical wastewater biological treatment methods and their microbial characteristics

Course Objective 5: Students are required to master the basic theoretical knowledge of microorganisms in water treatment, so that students can master the theoretical basis of microorganisms in the research, design, commissioning and operation of water treatment engineering, cultivate students' ability to solve complex problems in the professional engineering, and establish the belief of serving the country.

(2) Teaching methods

1. Pay equal attention to classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including multiple-choice questions, true/false questions, thinking questions, and question and answer questions, to deepen understanding and master the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Experiments

Cooperate with classroom teaching, organize corresponding experiments, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Jiang Haiyan, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of Economics and Budget Estimation for Water Engineering

Course name	Economics and budget estimates for water projects	Course number	9021112060						
English name	Economical and budgetary estimating of hydraulic works								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/> Self-directed development courses (compulsory <input type="checkbox"/> elective <input type="checkbox"/> intensive practical courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	not								
Teaching materials and reference materials	Course Textbook: Hydraulic Engineering Budget and Technical and Economic Evaluation, edited by Xiao Zuoyi, Machinery Industry Press, April 2011, 21st Century Higher Education Water Supply and Drainage Engineering Series Planning Textbook. References: Pricing specifications, related quotas, etc.								

1、 Course Description:

Economics and Budget Estimating for water Engineering) is a compulsory course for water supply and drainage science and engineering. Through the study, students are required to be proficient in the basic principles of economic analysis of water supply and drainage technology, evaluation indicators and methods, the content and methods of project financial evaluation and national economic evaluation, familiar with the basic principles and methods of project budget estimation, cultivate students' practical ability to calculate project cost, and be able to understand the development trend of project budget estimation, which is of great significance for cultivating the basic economic literacy and management decision-making ability of engineering students.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Students are required to be proficient in the basic principles of economic analysis of water supply and drainage technology, evaluation indicators and methods, the content and methods of project financial evaluation and national economic evaluation, and be able to conduct reasonable economic evaluation of projects.

Course Objective 2: Students are required to master the basic principles and methods of project budget estimation, be familiar with the use of corresponding budget estimation software, and cultivate students' ability to engage in project budget estimation.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

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Each chapter is equipped with corresponding exercises, including calculation questions, quiz questions, etc., to deepen understanding and grasp the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Class discussions

Arrange necessary class discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhou Jun, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus for Water Resources Utilization and Conservation

Course name	Water resource utilization and conservation	Course coding	9021113070						
English name	Utilization and conservation of water resources								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/> , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours		Computer-based hours	
Prerequisites	Hydraulics, hydrology and hydrogeology								
Teaching materials and reference materials	Textbook: Water Resources Utilization and Protection (3rd Edition), edited by Li Guanghe, China Architecture & Building Press, 2018. References: design manuals, specifications, related textbooks, etc.								

1、 Course Description:

Utilization and Protection of Water Resources is one of the main professional courses of water supply and drainage science and engineering. basic concepts, theories and methods of water resources evaluation and research; Comprehensively study and master the types, layout principles, layout methods, scope of application and applicable conditions of water resources utilization projects related to water supply, as well as the relevant technical parameters of water resources utilization projects; Learn and master the concepts, theories and methods of rational planning of water resources, joint dispatch and scientific management of various water bodies, and water pollution prevention and control, so as to lay a theoretical and technical foundation for the rational use and protection of water resources in the future.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To enable students to have an in-depth understanding of the global water resources status, formation and distribution characteristics, the basis of development and utilization status, master the basic concepts, theoretical methods and other related knowledge of water resources cycle and balance, water resources evaluation and research, cultivate students' ability to apply basic knowledge of water resources protection and utilization to solve related engineering problems, and establish a good professional ethics and sense of social

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responsibility.

Course Objective 2: To cultivate students' professional quality, guide students to master the types, layout principles, layout methods, scope of application and applicable conditions of water resources utilization projects related to water supply, as well as the relevant technical parameters of water resources utilization projects; Cultivate students' initial ability to design water resource utilization projects.

Course Objective 3: To cultivate students' sense of social mission, to enable students to understand the role of this course in environmental protection, society, energy conservation, etc., to master the concepts, theories and methods of rational planning of water resources, joint dispatch and scientific management of various water bodies, and water pollution prevention and control, so as to lay a theoretical and technical foundation for the rational use and protection of water resources in the future.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. problem

According to the difficulty of the knowledge points and the number of knowledge points, each chapter assigns corresponding exercises to deepen the understanding and grasp of the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions and practical sessions

Cooperate with classroom teaching, organize corresponding on-site visits and special discussions, guide students to connect theory with practice, broaden students' horizons, and cultivate students' ability to solve complex engineering problems.

Formulated by: Deng Yumei, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Water Supply and Drainage Network System (1) Syllabus

Course name	Water Supply and Drainage Network System(1)	Course number	9021113081						
English name	Water Supply and Drainage Engineering (1)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	2,0	Theoretical hours	32	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, pumps and pumping stations								
Teaching materials and teaching resources	Course materials: Yan Xushi, Gao Naiyun Beijing: Architecture & Building Press, 2020 References: relevant standards, specifications, design manuals, etc								

1、 Course Description:

Water-Supply and drainage Engineering (1) is one of the important professional courses in water supply and drainage science and engineering. Through the course study, students can master the basic knowledge of water supply system composition, water quantity prediction and water plant scale calculation, pipe network hydraulic calculation and verification, pipe network system layout and optimization calculation, pipe network technical management, etc., and can combine design manuals, standards, specifications (procedures), standard atlases, etc.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in the professional core knowledge system of water supply pipe network system, proficiency in the application of theoretical knowledge to engineering practice, and establishment of a good sense of professional ethics and social responsibility.

Course Objective 2: Have good scientific literacy and solid engineering foundation, scientifically and reasonably analyze the key factors of complex engineering problems in water supply pipe network, and have the basic ability to condense the essence of complex engineering problems in water supply pipe network system and propose effective solutions.

Course Objective 3: Proficiency in urban water supply network system planning, design principles, calculation methods and processes, and the ability to solve complex engineering problems. Through engineering practice, students develop a sense of social responsibility and establish the belief of serving the country.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion

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are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussion

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wang Cai, Director of the Department of Literature (Office) Review: Wang Aihe College Leader

Review: Li Yongsuo

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Water Supply and Drainage Network System (2) Syllabus

Course name	Water Supply and Drainage System Pipe Network(2)	Course number	9021113091						
English name	Water Supply and Drainage Engineering (2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	2.0	Theoretical hours	32	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, Pumps & Pumping Stations, Hydrology & Hydrogeology, etc								
Teaching materials and reference materials	Course textbook: Drainage Engineering (Volume I) (Fifth Edition), edited by Sun Huixiu, China Architecture & Building Press, 2015 References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Water-Supply and drainage Engineering (2).It is one of the compulsory courses of water supply and drainage science and engineering, which teaches the collection and transportation of sewage and the pipeline system engineering of the collection, transportation and discharge of precipitation in water supply and drainage engineering. Systematically describe the composition of the drainage system, the determination of the drainage system, the calculation of urban sewage volume, the hydraulic calculation theory and method of sewage and rainwater pipes, be able to carry out the planning and design of drainage pipeline engineering and the preparation of related documents, and master the relevant content of engineering optimization design theory and method; Understand the development process and direction of science and technology of drainage pipeline system, and initially have the ability to analyze and solve theoretical and engineering practical problems.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To enable students to master the basic concepts, functions, system composition and other related knowledge of water supply and drainage pipeline system, cultivate students' ability to apply the basic knowledge of water supply and drainage pipe network system to solve related engineering problems, and establish good professional ethics and social responsibility.

Course Objective 2: To cultivate students' professional quality, guide students to master the theory and method of sewage volume calculation and hydraulic calculation of pipe network system, and be able to design pipe network system; Cultivate students' ability to understand, master, analyze and apply the basic theories of drainage pipe network system. Able to use literature and materials, and initially have the ability to analyze and solve theoretical and engineering practices.

Course Objective 3: To cultivate students' sense of social mission, to enable students to understand the role of this course in environmental protection, social and health, and to understand the planning and design of drainage network system; Understand the basic skills in the operational management of drainage network systems. Broaden

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students' horizons, use the introduction of professional engineering, cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhang Chun/Yan Hengzhen, Director of the Department (Office) Review: Wang Aihe College

Leader Review: Li Yongsuo

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Syllabus of Building Water Supply and Drainage Engineering

Course name	Building water supply and drainage works	Course number	9021313101						
English name	Building water supply and drainage works								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	48	Credits	3.0	Theoretical hours	48	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, Pumps & Pumping Stations, Water Analytical Chemistry, etc								
Teaching materials and reference materials	Course textbook: Building Water Supply and Drainage Engineering (7th Edition), edited by Wang Changchang, China Architecture & Building Press. References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Building Water Supply and Drainage Engineering is a core course of water supply and drainage science and engineering, which is an engineering discipline that studies the collection, treatment and discharge of domestic water and fire water supply and sewage (waste) water in industrial and civil buildings, residential communities, and sewage (waste) water to meet the needs of life and production and create a hygienic, safe, comfortable living and production environment. Water supply and drainage is one of the indispensable engineering systems in modern buildings, and the quality of its design directly affects the living conditions, work effectiveness and safety of life and property of the occupants and people engaged in various activities in the building, and also affects the rationality of the project cost. In the actual construction, the demand for building water supply and drainage designers is significantly greater than the demand for designers in other aspects of the major, and doing a good job in the teaching of this course is one of the prominent and important properties of this major. The main task of this course is to develop students' ability to engage in the design of building water supply and drainage engineering and improve their own skills.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the course study, master the types of building water supply and drainage systems, understand the relationship between water supply and drainage science and engineering and architecture, environmental construction and other majors, understand the knowledge context and structural system of this major, and be able to apply it to solve complex engineering problems.

Course objective 2: Be familiar with the design specifications of building water supply and drainage, master the basis for the selection of water supply system, drainage system, fire protection system, etc., and have the ability

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to systematically analyze complex building water supply and drainage problems by means of literature retrieval and data review, and propose corresponding solutions and theoretical basis.

Course Objective 3: Master the characteristics and requirements of building water supply and drainage system, master the theoretical calculation method of building water supply and drainage system, and master the basic methods and processes of building water supply and drainage design.

Course Objective 4: To be able to analyse and evaluate the social, health, safety, legal and cultural impacts of fire protection and other designs, and to understand the responsibilities that should be assumed.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wang Aihe/Deng Jie Department (Office) Director Review: Wang Aihe College Leader Review:
Li Yongsuo

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Syllabus of Water Quality Engineering (1).

Course name	Water Quality Engineering(1)					Course number	9021113111		
English name	Water quality engineering (1).								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	Compulsory courses for majors								
Total credit hours	40	Credits	2.5	Theoretical hours	40	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, water supply and drainage network systems								
Refer to textbooks	Water Supply Engineering (Fourth Edition), edited by Yan Xishi and Fan Jinchu, China Architecture & Building Press, 2004 Calculation of Process Equipment for Water Treatment Structures, Li Hongbing, China Architecture & Building Press, 1999								

1. Course Introduction

Water Quality Engineering (1) is a core course of water supply and drainage science and engineering. The main task of this course is to enable students to comprehensively and systematically understand the basic concepts and theories such as the nature of water, the water quality characteristics of source water, and water quality indicators. Master the basic concepts, basic theories, basic methods and development status of water physics, chemistry and physicochemical treatment methods; Basically master the engineering technology principles and methods, application conditions, new processes and new technologies of urban water supply treatment and industrial water treatment, lay a theoretical and applied foundation for the engineering design, scientific research and operation management of the major in the future, and cultivate students' basic ability of design, operation management and scientific research of water supply treatment projects.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the study of theoretical knowledge of Water Quality Engineering (I), students will be familiar with the conventional and advanced treatment process of the treatment plant and the knowledge context structure system in the water supply treatment process, and be able to apply its basic principles to solve complex engineering problems;

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Course Objective 2: To have the ability to systematically analyze complex engineering problems in water supply treatment by means of literature retrieval and data review, and to provide a basis for proposing effective solutions to complex engineering problems;

Course Objective 3: To be proficient in the calculation methods and processes of water supply treatment engineering planning and design;

Course Objective 4: Initial ability to apply the results of experimental research to solve complex engineering problems of water supply;

Course Objective 5: To be able to analyse, evaluate and understand the social, health, safety, legal and cultural impacts of water supply engineering practices and solutions to complex engineering problems;

Course Objective 6: Be able to design water treatment engineering schemes, clearly express personal opinions, and have the initial ability to communicate and communicate with the project.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

This course is mainly lectured, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Hands-on teaching

In conjunction with the teaching content of this course, experiments such as coagulation, precipitation, filtration, adsorption, and desalination should be carried out. At the same time, cooperate with classroom teaching, organize corresponding on-site visits, and obtain necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zhang Chun/Li Yuanping Director of the Department (Office) Review: Wang Aihe College Leader
Review: Li Yongsuo

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Syllabus of Water Quality Engineering (2).

Course name	Water Quality Engineering(2)	Course number	9021113121						
English name	Water Quality Engineering(2)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>) , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	40	Credits	3.0	Theoretical hours	40	Practical hours	0	Computer-based hours	0
Prerequisites	Hydraulics, Pumps and Pumping Stations, Water Analytical Chemistry, Water Supply and Drainage Network Systems (2), etc								
Teaching materials and reference materials	Course Textbook: "Water Pollution Control Engineering" (Volume II) (Fourth Edition) Gao Tingyao, Gu Guowei, Zhou Qi (eds.), Higher Education Press References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Water Quality Engineering (2) is a core course of water supply and drainage science and engineering. On the basis of systematically introducing the nature of urban sewage, the characteristics and hazards of water pollution and the self-purification of water bodies, this course focuses on the theory and application of physical treatment, biological treatment, natural biological treatment, sludge treatment theory and application, and common sewage (sludge) treatment process system. The theory and application of physical treatment, chemical treatment and physicochemical treatment of industrial wastewater are described.

Through the study of this course, students will master the basic principles of water treatment, comprehensively and systematically understand the nature of water in the social cycle, the water quality characteristics and water quality standards of urban sewage, water pollution and self-purification, and other basic concepts and theories, and master the basic concepts, basic theories, basic methods and development status of water treatment, and basically master the engineering technology and methods, application conditions, new processes and new technologies of water treatment. Scientific research and operation management work to lay the necessary theoretical and applied foundation. Cultivate students' initial ability to design and calculate various structures and process systems in water quality engineering. It lays the necessary theoretical and applied foundation for the future engagement in water engineering design, scientific research and operation management of this specialty.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the course study, be familiar with the determination of the design flow rate and design water quality of the sewage treatment plant, be familiar with the selection of sewage treatment process system and treatment structure, understand the relationship between water supply and drainage science and engineering and other related majors, understand the knowledge context structure system of the major, and be able to apply it to solve complex engineering problems; Broaden students' horizons, use the introduction of professional

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engineering, cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country. Establish a good professional ethics and a sense of social responsibility.

Course Objective 2: Master the nature and pollution indicators of urban sewage, understand the outlet and discharge standards of sewage, understand the characteristics of each structure, and have the ability to systematically analyze complex water treatment engineering problems by means of literature retrieval and data review, so as to propose corresponding solutions and theoretical basis.

Course objective 3: Master the characteristics of various types of urban sewage and their most suitable treatment processes and technological processes, master the design and calculation of water treatment processes, master the calculation methods and processes of engineering planning and design of this major, and design reasonable solutions for complex engineering problems.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Yan Hengzhen, Director of the Department (Office) Review: Wang Aihe College Leader Review:

Li Yongsuo

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Syllabus of water engineering construction

Course name	Water engineering construction				Course number	9021113130			
English name	Construction of water conservancy projects								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	Faculty of Civil Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	Building water supply and drainage engineering, water process equipment foundation, water quality engineering, water supply and drainage pipe network system, etc.								
Teaching materials and reference materials	Course textbook: Shao Linguang Beijing: China Architecture & Building Press, 2012 References: design manuals, specifications, relevant standards, related teaching materials, etc								

1、 Course Description:

Water Project Construction is one of the important basic courses of water supply and drainage science and engineering, which is comprehensive and practical. Through the study of this course, students will understand the nature and performance of water supply and drainage structures and pipelines; Understand the performance and use of mechanical equipment in the construction of this specialty; Master the construction theory and methods of the professional project and the practical operation skills in the construction; Improve the design ability of water engineering, consider the construction process requirements in the design, and design water engineering buildings that meet the construction requirements and facilitate the construction of the project. Understand and master the basic principles and methods of modern scientific construction management, be able to combine the specific conditions of engineering construction, reasonably select construction plans and methods, and organize the preliminary ability of water supply and drainage engineering construction.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be familiar with the methods, technical principles and processes of construction, and to be able to apply the basic theories to solve complex engineering problems.

Course Objective 2: Master the means of literature retrieval and data review, the ability to systematically analyze complex engineering problems in water engineering construction, and propose effective solutions to

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provide a basis;

Course objective 3: To be able to make reasonable choices of instruments and equipment used in water engineering, and analyze and evaluate the impact of solutions to problems related to water engineering construction on society and safety

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Deng Jie, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Experimental syllabus for water quality engineering

Course name	Water quality engineering experiments	Course number	9021213140						
English name	Water supply engineering experiments								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> <input type="checkbox"/> basic courses <input type="checkbox"/> major core courses (elective compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practical courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	1.0	Theoretical hours	8	Practical hours	24	Computer-based hours	0
Prerequisites	General Chemistry, Physical Chemistry, Water Analytical Chemistry, Water Treatment Biology, Water Quality Engineering								
Teaching materials and reference materials	Wu Junqi, editor-in-chief. Experimental Techniques for Water Treatment (3rd Edition). Beijing: China Architecture & Building Press, 2009; The laboratory compiled its own experimental instruction book "Water Quality Engineering Experiment".								

1、 Course Description:

Water supply engineering experiment is a compulsory course for water supply and drainage science and engineering majors, which aims to deepen students' understanding of the basic principles of water treatment technology and cultivate students' initial ability to design and organize water treatment experimental schemes. To cultivate students' general skills in conducting water treatment experiments and the basic ability to use experimental instruments and equipment; Cultivate students' basic ability to analyze and process experimental data.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

The following objectives should be achieved through the teaching of this course:

Course Objective 1: Master the purpose, principle, experimental instruments and experimental procedures of the experiment, and deepen the understanding of the basic concepts, phenomena, laws and basic principles of water treatment.

Course objective 2: To enable students to master experimental methods and experimental conclusions, master general water treatment experimental skills, use of equipment, have a certain ability to solve experimental technical problems, and broaden students' horizons.

Course Objective 3: To master the methods of designing experimental protocols and organizing experiments, and to measuring, analyzing, and processing experimental data, so as to be able to draw practical conclusions. Cultivate students' academic ethics, mobilize students' enthusiasm for learning, and establish the belief of serving the country.

(2) Teaching methods

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Self-directed learning before class: watch videos on the online teaching platform, preview the experimental principles, and complete the test.

Classroom Collaborative Exploration: Through the combination of virtual simulation experiments and actual experimental operations, group experiments, centralized discussions and other methods are used to guide students to complete the experiments individually.

After-class consolidation and development: The online teaching platform interactively answers questions, and students complete the thinking and discussion questions.

Formulated by: Li Hao, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Basic syllabus for water process equipment

Course name	Fundamentals of water process equipment	Course number	9021113150						
English name	Water process and equipment elements								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	Water Quality Engineering (1), (2) and Building Water Supply and Drainage Engineering								
Refer to textbooks	Huang Tinglin, "Fundamentals of Water Process Equipment" (Third Edition), China Architecture & Building Press								

1、 Course Description:

The Elements of Water Technics and Equipment is one of the main professional foundation courses in Water Supply and Drainage Science and Engineering. This course mainly introduces the types and characteristics of commonly used materials for water process equipment, the corrosion, protection and insulation of materials and equipment, and the basic knowledge of the design, manufacturing and processing theory of water process equipment, and describes the types, working principles and applicable conditions of common water process equipment. Through the study of this course, students should obtain the basic knowledge of corrosion, protection and insulation of common materials and materials of water process equipment, equipment, master the basic theory of water process equipment, and be familiar with the classification, form and working principle of water process special equipment, so that students can initially have the basic ability of water process equipment development, design, selection and operation management, and lay a good foundation for future work.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To understand the operating principles and types of water treatment equipment, and to understand and master the use and limitations of necessary water treatment technologies and information technology tools.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Exercises are assigned to each chapter to deepen understanding and grasp the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

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Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wang Aihe Department (Office) Director Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of Instrumentation and Control for Water Supply and Drainage Engineering

Course name	Instrumentation and control of water supply and drainage engineering		Course number	9021113160					
English name	Instrumentation and control of water supply and drainage engineering								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input checked="" type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	Water quality engineering, electronic engineering, water supply and drainage network systems								
Teaching materials and teaching resources	Course materials: Cui Fuyi, Peng Yongzhen "Water Supply and Drainage Engineering Instrumentation and Control" (3rd Edition)[M]. Beijing: China Architecture & Building Press, 2017								

1. Course Introduction

《给排水工程仪表与控制》(Instrument and control of water supply and drainage engineering) 是给排水科学与工程专业的专业核心课程。

The instrumentation and control of water supply and drainage engineering organically combines water supply and drainage engineering with instrument automation, which is an important tool to improve the automation, intelligence and intelligence of water supply and drainage engineering. This course teaches the necessary basic theories, basic knowledge and basic skills related to instrument automation and control in water supply and drainage science and engineering, cultivates students' logical thinking ability, knowledge application ability, automatic calculation and design ability, and has the ability to apply instrument automation technology to solve water supply and drainage science and engineering operation and management problems, and lays a foundation for learning follow-up courses and engaging in related engineering and technical work and scientific research work. Through the study of this course, students will have the basic ability to read and design the automation schemes commonly used in water supply and drainage science, and initially have the ability to communicate with relevant majors and put forward the monitoring requirements of the process system, and have the foundation of smart water affairs.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course objective 1: By learning the basic concepts of automatic control and the basic knowledge of detection technology, master the classification, principle, characteristics and applicable conditions of the main water supply and drainage automation instruments and equipment, master the pump speed control, constant pressure water supply system control technology, and sewage pumping station combined operation system and other related content, and use frequency conversion speed regulation technology to solve the problem of constant pressure water supply of pumps. Master the system control technology of typical water supply treatment unit and the application of PLC-based distributed control system in water plant, and initially have the ability to use automatic control technology to solve the efficient and economical operation of water supply treatment system; Students master the

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monitoring and operation mode of sewage treatment plant, the process control of primary sewage treatment, the process control of secondary sewage treatment, and understand the ICA technology of sewage treatment system, so that students can initially have the ability to apply automatic control technology to realize the operation and management of water supply and drainage system treatment equipment. Through the introduction of practical cases, the students' engineering ethics and morality are cultivated, the students' enthusiasm for learning is mobilized, the belief of serving the country is established, and the students' sense of professional identity is stimulated.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Yuan Yueyang, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Engineering Surveying Syllabus

Course name	Engineering Surveying	Course number	9024312821						
English name	Engineering Surveying								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Courses <input type="checkbox"/> , Subject Basic Courses, <input type="checkbox"/> Major Core Courses (Elective <input type="checkbox"/> Compulsory <input type="checkbox"/>), Self-Development Courses (Compulsory <input type="checkbox"/> Electives <input checked="" type="checkbox"/>), and Intensive Practice Courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	2,0	Theoretical hours	28	Practical hours	4	Computer-based hours	0
Prerequisites	Advanced Mathematics, Probability Theory and Mathematical Statistics, etc								
Teaching materials and reference materials	Course textbook: Engineering Surveying (3rd Edition) edited by Li Zhangshu Chemical Industry Press References: various specifications, related teaching materials, etc								

1、 Course Description:

Engineering Surveying is a self-developed course for water supply and drainage science and engineering. It is a highly practical course that combines theory and practice. The main contents include the basic knowledge, basic theory and basic methods of engineering surveying; Plane and elevation control surveying, topographic map surveying and mapping, topographic map application, etc. Through theoretical study and practical training, students will be trained to have the ability to measure, calculate, draw and use drawings, have certain measurement data processing and analysis skills, and be familiar with the operation process of engineering surveying; Cultivate students' scientific spirit of seeking truth from facts and the work style of unity, cooperation, hardship and hard work, and lay the foundation for students to engage in engineering survey, design, construction, management and other work.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course objective 1: Understand the basic concepts of surveying, master the structural characteristics and use methods of measuring instruments, be familiar with relevant engineering surveying specifications, understand the calibration methods of measuring instruments, and be able to select appropriate modern measuring instruments and tools according to the construction environment and engineering characteristics when solving complex problems of engineering surveying;

Course Objective 2: Master the establishment method of survey coordinate system, plane control and elevation control surveying, data processing, topographic map surveying and mapping and other professional knowledge, be familiar with topographic map schema, understand the basic knowledge and basic principle of error of topographic map, have the ability to read and apply topographic map, and initially have the ability to analyze, reason and solve engineering problems.

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Course Objective 3: Have a strict and serious scientific attitude, a realistic work style, a hard-working attitude and a collective concept of unity and cooperation; Students will be trained in their operational organization and practical work skills, and will lay the foundation for their future participation in work.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in the classroom, and some of the content is mainly self-study, and Q&A and discussion are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including fill-in-the-blank questions, short-answer questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Practical operation

Through the operation of surveying and mapping instruments, master the structure, principle and measurement method of the instrument.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Cao Yuanzhi, Director of the Department (Office) Review: Zhou Zhongyu, College Leader

Review: Li Yongsuo

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AutoCAD Fundamentals Syllabus

Course name	AutoCAD Basics				Course number	9021324170			
English name	AutoCAD Fundamentals								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input type="checkbox"/> electives <input checked="" type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	16	Credits	0.5	Theoretical hours	0	Practical hours	16	Computer-based hours	0
Prerequisites	Engineering Drawing								
Teaching materials and reference materials	Course textbook: "CAD for Water Supply and Drainage Engineering", edited by Zhao Xingxing, Machinery Industry Press References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

AutoCAD Foundation This course is an elective course for water supply and drainage engineering majors, and this syllabus is designed for water supply and drainage students. Water supply and drainage CAD is based on the basic requirements of architectural drawing and the requirements of water supply and drainage majors, and uses various CAD software (including AutoCAD and Tianzheng water supply and drainage CAD, etc.) with high efficiency, easy editing and wide application to cultivate the ability of water supply and drainage students to skillfully use CAD software for water supply and drainage engineering drawing.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

This course enables students to systematically learn and master the basic operation methods of CAD software, preliminarily master the basic skills of using CAD to draw water supply and drainage engineering graphics, and cultivate students' basic ability to have the overall drawing ideas of water supply and drainage engineering graphics. At the same time, the special requirements and professional norms of the profession are introduced and combined.

The following objectives should be achieved through the teaching of this course:

Course Objective 1: To be proficient in the application of basic AutoCAD drawing commands, and to master the concepts, definitions and applications of AutoCAD layers, dimensions, text annotations and blocks.

Course Objective 2: Master the drawing of plane and section drawings of water treatment structures, cultivate students' basic ability to draw overall drawings of water supply and drainage engineering graphics, and cultivate students' engineering literacy and rigorous drawing spirit.

Course objective 3: Understand the commonly used CAD secondary development software and its application in the engineering design of the major, broaden the horizon, and cultivate the awareness of independent learning and lifelong learning.

(2) Teaching methods

1. Classroom Teaching:

(1) Change the traditional multimedia teaching method, adopt the way that students bring their own laptops or

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teach directly in the computer room, first of all, the teacher uses multimedia equipment to demonstrate the basic operation of CAD software, and then the students carry out their own operation exercises, and the teacher can randomly check the students to demonstrate on stage after the students practice, so as to understand the mastery of the students;

(2) Adopt the case teaching method. For example, a single drawing of a process structure in the water supply and drainage standard atlas is sent to students as a practical assignment, which includes not only the requirements of CAD two-dimensional drawing and editing commands, but also the requirements of industry drawing standards; In the follow-up teaching process, the drawing is decomposed and integrated into the teaching of each chapter, so that students can master the specific use of these commands in the drawing of water supply and drainage engineering while learning the basic CAD commands. After the lecture, students are instructed to integrate the commands they have learned and complete the drawing of practical assignments.

2. Correct homework on time and find out the problems in the teaching process in time.

3. Pay attention to after-school tutoring.

Formulated by: Li Hao, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li

Yongsuo

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Syllabus of Computer Application Fundamentals of Water Supply and Drainage Engineering (including BIM Technology).

Course name	Computer Application Basics of Water Supply and Drainage Engineering (including BIM Technology)			Course number	9021324190				
English name	Computer applications for sewer works								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Lessons <input type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input checked="" type="checkbox"/> Compulsory <input type="checkbox"/> Self-development course (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practice class <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	32	Credits	1.0	Theoretical hours	8	Practical hours	0	Computer-based hours	24
Prerequisites	Engineering drawing, hydraulics, pumps and pumping stations, water supply and drainage pipe network systems, building water supply and drainage engineering								
Teaching materials and reference materials	Course textbook: CAD for Water Supply and Drainage Engineering, Zhao Xingming, China Machine Press, 2014. References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Computer Application of Water Supply and Sewerage Engineering is one of the elective courses for water supply and drainage science and engineering. Based on the basic requirements of architectural drawing and the requirements of water supply and drainage science and engineering, the course introduces the principles, characteristics and basic operation steps of the most frequently used and widely used auxiliary design software - CAD, TENGGEN construction software, TENGGEN water supply and drainage software, Hongye municipal pipeline (or pipe), BIM and other software, and cultivates students' ability to master and apply professional software for water supply and drainage engineering drawing.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course objective 1: Understand the installation of CAD, TENGGEN construction software, TENGGEN water supply and drainage software, Hongye municipal pipeline (or pipe), BIM and other software, master the design and basic operation of its working environment, and be able to use software to design and draw professional drawings, have the ability to solve practical engineering problems, and establish a good professional ethics and social responsibility.

Course Objective 2: Master the development of professional software related to water supply and drainage science and engineering, integrate advanced drawing technology into design, and have the ability to adapt to social and technological development.

(2) Teaching methods

1. Classroom teaching and computer operation

The class teaches the basic concepts, software design, and main operation essentials of the software, and conducts operation demonstrations, arranges the necessary computer time according to the teaching content and class time, and conducts computer operation exercises.

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2. Exercises

Each chapter is equipped with corresponding drawing exercises to deepen understanding, grasp and apply the content taught in class, and cultivate students' ability to operate and draw independently.

Formulated by: Deng Yumei, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of Engineering Project Management

Course name	Engineering project management	Course number	9041124010						
English name	Construction project management								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> <input type="checkbox"/> basic courses major core courses (elective <input type="checkbox"/> , compulsory <input type="checkbox"/>) self-development courses (compulsory <input type="checkbox"/> electives <input checked="" type="checkbox"/>) and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Management								
Total credit hours	24	Credits	1.5	Theoretical hours	24	Practical hours	0	Computer-based hours	0
Prerequisites	Civil engineering foundation, water engineering construction, etc								
Teaching materials and references information	Course materials: "Engineering Project Management", edited by Tang Yong, China Electric Power Press 2016 References: construction project management specifications, related teaching materials, etc								

1、 Course Description:

Construction Project Management is an elective course for water supply and drainage science and engineering. It aims to guide students to understand and master the basic knowledge and methodology system of organizational model construction, process decision-making and functional management of contracts, costs, schedules, quality, safety and environment from the perspective of the owner, establish the whole process management awareness and system awareness of the project, and clarify the division of responsibilities and professional quality requirements of different management functions. The course of "Engineering Project Management" highlights the engineering as the object, combines the theory of engineering management with the application of engineering management, emphasizes the fact as the basis for management decision-making, and understands the internal logic and promotion process of project management with collaborative thinking, which can effectively improve students' ability to solve practical engineering project management problems and form an overall and systematic management philosophy.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

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Course Objective 1: Through the course learning, master the characteristics of the professional engineering type, the engineering organization model and the composition and operation rules of the contract, cost, schedule, quality, resources, safety and environment, and understand the position setting and main responsibility objectives of the different functions of the professional engineering management.

Course objective 2: To establish the whole process management of the project, the system management thinking, understand the basic criteria of multi-objective collaborative promotion of project management, and fully fulfill the social responsibility of project management personnel in terms of public safety, health and well-being.

Course objective 3: Understand and master the methodology for the realization of various functions of engineering management in this major, be able to use relevant basic data to make systematic decisions on various functions, and be able to flexibly adopt the whole process method of project from plan implementation to control feedback.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Liu Sihui Department (Office) Director Review: Liu Sihui College Leader Review: Sun Qian

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Syllabus of English for Professional Applications

Course name	Professional English				Course number	9021113200			
English name	English for sewer engineering professionals								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input checked="" type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	16	Credits	1	Theoretical hours	16	Practical hours	0	Computer-based hours	0
Prerequisites	College English (1), College English (2), College English Extension Series (1), College English Extension Series (2), Water Supply Engineering, Drainage Engineering, Building Water Supply and Drainage								
Teaching materials and teaching resources	Course textbooks: Wang Lichun, Mi Hairong et al. Harbin Engineering University Press References: relevant standards, specifications, design manuals, etc								

1、 Course Description:

Professional English on Water Supply and Sewerage Engineering is an elective course for water supply and drainage majors, through the teaching of this course, students can master a certain amount of professional vocabulary, terminology and common English abbreviations. Be proficient in reading and correctly understanding the relevant English materials of the major to obtain scientific and technological information and professional knowledge; Through reading various forms of professional English articles, students will lay a foundation for future translation, reading professional articles, and translating and consulting professional literature; Familiar with the characteristics of technical English, cultivate certain translation and writing skills, improve the ability to use English practically, and lay a good foundation for students to communicate and exchange in a cross-cultural and cross-professional context.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course objective 1: To equip students with the ability to read the English literature of the major, requiring students to master at least 1500 common vocabulary and idiomatic expressions of the major, cultivate students' professional quality, and establish a good professional ethics and sense of social responsibility.

Course objective 2: To understand professional literature, and at the same time have the ability to skillfully translate professional literature from English to Chinese and the initial ability to write professional papers in English, cultivate students' awareness of independent learning and lifelong learning, and establish national self-confidence and patriotic feelings.

Objective 3: To equip students with an international perspective, to be able to communicate and exchange in a cross-cultural and cross-professional context, and to establish a belief in serving the country.

(2) Teaching methods

1. Pay equal attention to classroom teaching and self-study

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It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Translation

The content of each chapter is translated accordingly to deepen the understanding and grasp of the content taught in class, and cultivate students' ability to think, analyze and solve problems independently.

3. Report in English

Cooperate with classroom teaching, organize corresponding theme groups for students to report in English, and cultivate students' ability to communicate in English.

Formulated by: Jiang Haiyan, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Interpretation and application of water supply and drainage design code syllabus

Course name	Interpretation and application of water supply and drainage design codes			Course number	9021824210				
English name	Interpretation and application of water supply and drainage design codes								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> self-development courses (compulsory <input checked="" type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	16	Credits	0.5	Theoretical hours	0	Practical hours	16	Computer-based hours	0
Prerequisites	Water supply and drainage network system, water quality engineering, building water supply and drainage engineering								
Teaching materials and reference materials	not								

1、 Course Description:

"Interpretation and application of water supply and drainage design specification" is an independent development course of water supply and drainage science and engineering, which mainly explains the main reference specifications of water supply and drainage science and engineering design process. Through the interpretation of the norms, students can master the main normative provisions of water supply and drainage professional design, comprehensively and systematically understand the basic methods and basic requirements of water supply and drainage engineering design, and lay the necessary theoretical and application foundation for future engineering design, scientific research and operation management of this major. Cultivate students' initial ability to design and calculate various structures and process systems in water quality engineering. It lays the necessary theoretical and applied foundation for the future engagement in water engineering design, scientific research and operation management of this specialty. Enhance the sense of mission and pride in the design and development of water supply and drainage projects in China.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Through the course study, understand the basic methods and basic requirements of water supply and drainage engineering design, and lay the necessary theoretical and applied foundation for future engagement in engineering design, scientific research and operation management of this major.

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Course Objective 2: To be familiar with the main design codes for water supply and drainage, and to understand the engineering design requirements of the main design codes.

(2) Teaching methods

1. Thematic lectures

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Thematic discussion

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Wang Aihe Department (Office) Director Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of Water Engineering Operations and Management

Course name	Water engineering operation and management	Course number	9021824220						
English name	Operation and management of waterworks projects								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input checked="" type="checkbox"/> /electives <input type="checkbox"/>) , and intensive practice courses <input type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	16	Credits	0.5	Theoretical hours	16	Practical hours	0	Computer-based hours	0
Prerequisites	Water supply and drainage pipe network system, water quality engineering, building water supply and drainage engineering, water engineering construction								
Teaching materials and teaching resources	Course materials: Chen Wei, Zhang Jinsong Urban Water System Operation and Management (2nd Edition). Beijing: China Architecture & Building Press, 2010 References: relevant standards, specifications, design manuals, etc								

1、 Course Description:

Operation and Management of Water Engineering It is one of the important professional courses of water supply and drainage science and engineering, mainly for senior undergraduate students of water supply and drainage science and engineering. The main task of this course is to study the operation of urban water system, including the utilization and protection of water resources, the operation, maintenance and management of water supply treatment plants, the operation, maintenance and management of sewage treatment plants, the technology and management of urban sewage treatment and recycling, the operation and management of electrical and mechanical equipment of water treatment plants, the operation and maintenance and management of urban water supply pipe networks, drainage pipe networks and pumping stations, the operation and management of enterprises and the investment and financing of water supply and drainage projects, etc., so that students can master the basic processes of water supply and sewage plant management and operation. Through methodological teaching, case analysis, in-class group discussions, and other teaching forms, the course consolidates the theoretical knowledge of water treatment, cultivates the practical ability of water treatment operation and management, and improves its ability to analyze and solve complex problems in the operation and management of water system.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: To learn about the operation and management system, content, and objectives of urban water systems, as well as the relationship between urban water resources and urban construction. The corresponding protection and management measures of the urban water resources system have the basic ability of the operation and management of urban water intake structures. Learn the daily maintenance and operation management of water supply treatment plants and the principles, management and maintenance of various water

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supply treatment processes, and be able to propose reasonable solutions to the abnormal problems existing in each water supply process, and have the ability to operate, maintain and manage water supply treatment. In practice, social, economic, health, safety, legal, cultural and environmental constraints are taken into account.

Course objective 2: Through learning the sewage treatment process and daily maintenance and operation management, master the theoretical knowledge of different sewage processes, have reasonable solutions to the abnormal problems existing in each sewage process, and have the ability to operate, maintain and manage sewage treatment. Be able to analyze and evaluate the impact of engineering practice on environmental protection and sustainable development of complex engineering problems in this specialty.

Course Objective 3: Through the study of this chapter, students will master the operation and management of pipeline systems; Basic knowledge of the operation and management of drainage pipes and canals, and the ability to use these knowledge to carry out technical management and maintenance of the drainage pipe network. Have the ability of water supply and drainage science and engineering engineering management principles and economic decision-making;

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content needs to be reviewed and consolidated before and after class, and Q&A and discussion are arranged after class.

2. Exercises

This course is an engineering case course, and it is also an investigation course, and there are no exercises in the course.

Formulated by: Zhou Jun, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Electronic and Electrician Training A Syllabus

Course name	Electronic and Electrician Training A				Course number	9161715010			
English name	Electrical & Electronic Training A								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General Education Lessons <input type="checkbox"/> Discipline basic courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>) and self-development courses (compulsory <input type="checkbox"/> Take <input type="checkbox"/> Intensive practical lessons <input checked="" type="checkbox"/>								
Offering unit	Engineering Training Center								
Total credit hours	1 week	Credits	1,0	Theoretical hours	0	Practical hours	1 week	Computer-based hours	0
Prerequisites	University Physics, Electrical and Electronic Technology								
Teaching materials and teaching materials	Course materials: Chen Caibiao, Zeng Pinghong. Xi'an: Northwestern Polytechnical University Press, 2018								

1、 Course Description:

Electronic and Electrical Engineering Training A is a concentrated practical course in water supply and drainage science and engineering. It includes two links: electrician training and electronic training. Electrician training is one of the practical teaching links of skills training for students majoring in science and engineering, this course focuses on introducing the application knowledge in electrical technology and cultivating students' hands-on ability, which plays a very important role in improving students' ability to analyze and solve practical problems. The purpose of the teaching is to enable students to master the common sense of safe electricity use, to master the use of common electrical tools, instruments and meters, to enable students to have a preliminary understanding of the basic training of electricians, lighting circuits and electric traction training, and to lay a solid foundation for the improvement of students' future electrical circuit design and application skills, engineering design ability and scientific research ability. Electronic training is a technical and practical technical basic course, one of the compulsory practical courses for science and engineering students, and an important practical teaching link for shaping high-quality and application-oriented talents in the new era. This course emphasizes practical teaching, pays attention to the improvement of students' ability to integrate theory and practice, and attaches importance to the cultivation of engineering quality. The purpose of teaching is to enable students to master the correct identification and detection methods of commonly used electronic components, and to understand and master the basic skills and knowledge of the use of commonly used electronic instruments; Master the basic knowledge and basic skills of soldering technology, and acquire manual soldering skills for electronic circuit boards and printed circuit boards; Understand the design process of electronic products through the assembly and commissioning of electronic products. Lay a solid practical foundation for further study of professional courses and subsequent course design and graduation project.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the practical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Master the common sense of safe electricity use, and be proficient in the use of common electronic and electrical tools and instruments; Master the connection method of a variety of wires; Master the installation methods of lighting fixtures, switches and sockets; Master the principle and practical operation of

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three-phase asynchronous motor jog control circuit, self-locking control circuit, forward and reverse control circuit.

Course Objective 2: Master the basic functions, usage methods and operation precautions of commonly used electronic instruments such as DC regulated power supplies, function generators, digital storage oscilloscopes, and digital multimeters; Learn the identification and detection of commonly used electronic components; Master the process knowledge of manual soldering, the use of flux and solder, the quality of solder joints and influencing factors; Master the correct use of common welding tools and assembly tools; Master the production process and debugging process of electronic products.

(2) Teaching methods

1. Emphasis is placed on both classroom teaching and self-study

It is mainly taught in class, and some of the content is mainly self-study, and questions and discussions are arranged after class.

2. Exercises

Each chapter is equipped with corresponding exercises, including thinking questions, quiz questions and calculation questions, to deepen their understanding and grasp of the content taught in class, and to cultivate students' ability to think, analyze and solve problems independently.

3. Visit

Cooperate with classroom teaching, organize corresponding on-site visits, and acquire the necessary perceptual knowledge.

4. Thematic discussions

Arrange necessary thematic discussions according to the teaching content and class time, broaden learning ideas, and improve the ability to analyze and solve problems.

Formulated by: Zeng Ying/Qiu Biao Department (Office) Director Review: Zeng Ying College Leader Review:
Jiang Dongchu

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Syllabus of Surveying Practice

Course name	Surveying Practicum	Course number	9024715800		
English name	Surveying Practices				
Applicable majors	Water Supply and Drainage Science and Engineering				
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>				
Offering unit	School of Municipal and Surveying Engineering				
Total credit hours	2 weeks	Credits 2.0	Theoretical hours 0	Practical hours 2 weeks	Computer-based hours 0
Prerequisites	Engineering Surveying				
Refer to textbooks	"Surveying Experiment Practice Guide", edited by the Department of Surveying and Mapping, Hunan City University				

1. Course Introduction

"Surveying Practice" is an important practical teaching part of the undergraduate major of water supply and drainage science and engineering, through which students can master the principles and methods of using common surveying and mapping instruments, information technology tools, engineering tools and simulation software, and understand their limitations. Ability to work in teams in a multidisciplinary context as individuals, team members, and principals.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through practical and practical placements in this course, students will be equipped with the following abilities:

Course objective 1: Understand the basic concepts of surveying, master the structural characteristics and use methods of measuring instruments, be familiar with relevant engineering surveying specifications, understand the calibration methods of measuring instruments, and be able to select appropriate modern measuring instruments and tools according to the construction environment and engineering characteristics when solving complex problems of engineering surveying;

Course Objective 2: Have a strict and serious scientific attitude, a realistic work style, a hard-working attitude and a collective concept of unity and cooperation; Students will be trained in their operational organization and practical work skills, and will lay the foundation for their future participation in work.

Formulated by: Wang Ping, Director of the Department (Office) Review: Zhou Zhongyu, College Leader Review:

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Li Yongsuo

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Understanding the Practicum (1) Syllabus

Course name	Understanding Internship (1)	Course number	9021615240						
English name	Cognitive exercises (1).								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	1 week	Credits	1	Theoretical hours	0	Practical hours	1 week	Computer-based hours	0
Prerequisites	Introduction to Water Supply and Drainage Science and Engineering, Hydraulics, Pumps and Pumping Stations, Water Treatment Microbiology, Water Analytical Chemistry								
Refer to textbooks	"Water Supply Engineering", "Water Pollution Control Engineering", "Building Water Supply and Drainage Engineering", "Pumps and Pumping Stations", etc								

1. Course Introduction

Cognition practice (1) is an important part of the undergraduate study of water supply and drainage science and engineering, through the understanding of practice, students have a preliminary understanding and understanding of water supply and drainage engineering, improve students' understanding of the role and status of water supply and drainage engineering in the development of national economy and social and economic construction, enhance perceptual understanding, and stabilize professional thinking. Through teaching visits, special lectures and other means, students have a preliminary understanding of water supply treatment plants, sewage treatment plants, building water supply and drainage projects, etc. By linking theory with practice, students will develop practical ability and lay a good foundation for the professional knowledge they will be exposed to.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Familiar with the overall layout of the urban water supply system, the actual production process of the water supply treatment plant, the building water supply and drainage fire protection demonstration system, the overall layout of the urban sewage treatment plant, the types, operation and maintenance management methods of various treatment structures (facilities), have a good humanities and social science literacy and a strong sense of social responsibility, and be able to understand and abide by the engineering professional ethics and norms in this field.

Course Objective 2: To be able to take on the roles of individual, team member and leader in a

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multidisciplinary context.

(2) Teaching methods

Mainly adopt the method of on-site teaching, through the visit of water supply treatment plant, sewage treatment plant and building water supply and drainage fire demonstration system and lead teachers to explain and answer questions on the spot, and arrange special lectures according to the actual situation. The special lectures mainly answer questions and expand knowledge about new processes and technologies that are not fully documented or not well understood in the process of understanding the internship.

Formulated by: Yan Hengzhen, Director of the Department (Office) Review: Wang Aihe College Leader Review:
Li Yongsuo

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Pumps & Pumping Station Course Design Syllabus

Course name	Pump & Pumping Station Course Design	Course number	9021415250						
English name	Course design for pumps and pumping stations								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>) , and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	1 week	Credits	1	Theoretical hours	0	Practical hours	1 week	Computer-based hours	0
Prerequisites	Hydraulics, Pumps & Pumping Stations, Engineering Drawing								
Teaching materials and teaching resources	Course materials: Zhang Wei, Zhou Shukui. Water pump and water pumping station[M]. Beijing: Peking University Press, 2014 References: relevant standards, specifications, design manuals, etc								

1、 Course Description:

Course Design of Pump and Pump station The course is a concentrated practical teaching link after the core compulsory course "Pumps and Pumping Stations". The purpose of the course is to consolidate the students' comprehensive use of the theoretical knowledge learned in "Pumps and Pumping Stations", make reasonable use of relevant standards, specifications, design manuals, computer-aided software, etc., master the calculation methods and processes of pumping station process design, exercise the level of design specification writing, drawing expression and communication, cultivate the ability to combine theory and practice, analyze and solve engineering problems, and lay the foundation for relevant work after graduation.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in pumping station process design and calculation methods and processes, and the ability to solve engineering practice problems.

Course objective 2: The ability to comprehensively consider social, economic, environmental and other constraints, and creatively propose new schemes, new technologies, new materials and other preliminary solutions to the process design of pumping stations.

Course Objective 3: Master the writing format and depth requirements of the design specification text, and master the skills and methods of drawing engineering drawings and expressing results.

Formulated by: Wang Cai, director of the Department of Literature (Office) Audit: Wang Aihe College Leader

Review: Li Yongsuo

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Syllabus design for building water supply and drainage courses

Course name	Curriculum design of building water supply and drainage engineering				Course number	9021415260			
English name	Curriculum design of building water supply and drainage engineering								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Hydraulics, Pumps & Pumping Stations, Water Analytical Chemistry, etc								
Teaching materials and teaching resources	Course Textbook: Wang Chang. Building Water Supply and Drainage Engineering (7th Edition) [M], Beijing: China Architecture & Building Press, 2016. References: relevant standards, specifications, design manuals, etc.								

1、 Course Description:

Course design of building water supply and drainage engineering is a practical teaching content that complements the course of building water supply and drainage engineering, and is an important centralized practical teaching link. The purpose of this course is to digest and consolidate the basic theories and knowledge of Building Water Supply and Drainage Engineering, to learn the methods and processes of applying theoretical knowledge to practical engineering, to cultivate the ability to combine theory and practice, analyze and solve problems, to improve students' design calculation skills and ability to write design specifications, and to lay a foundation for the study of relevant practical links and related work after graduation. Its mission is to make students further familiar with the schematic design of various systems of building water supply and drainage engineering, master the principles and methods of design and calculation of building water supply and drainage engineering, and cultivate and improve the level of design and drawing of students.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in the design and calculation methods and processes of building water supply system, drainage system and fire protection system, have the ability to solve engineering practice problems, and establish a good professional ethics and sense of social responsibility.

Course Objective 2: The ability to comprehensively consider social, economic, environmental and other

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constraints, and creatively propose new schemes, new technologies, new materials and other preliminary solutions to the design of building water supply and drainage systems. Cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country.

Course Objective 3: Master the writing format and depth requirements of the design specification text, and master the skills and methods of drawing engineering drawings and expressing results. Broaden students' horizons, use the introduction of professional engineering, cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country.

Formulated by: Deng Jie/Wang Aihe Department (Office) Director Review: Wang Aihe College Leader Review:
Li Yongsuo

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Syllabus for the design of the water supply network course

Course name	Water supply network course design	Course number	9021415270						
English name	WaterSupplyPipeSystem								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Hydraulics, pumps and pumping stations, water supply and drainage network systems (1).								
Teaching materials and teaching resources	Course materials: Yan Xushi, Gao Naiyun Beijing: Architecture & Building Press, 2020 References: relevant standards, specifications, design manuals, etc								

1、 Introduction To course design

"Course Design of WaterSupplyPipeSystem" This course is a concentrated practical teaching session after the core compulsory course "Water Supply and Drainage Network System (1)". The purpose of the course is to train students to comprehensively use the theoretical knowledge learned in "Water Supply and Drainage Network System (1)", make reasonable use of relevant standards, specifications, design manuals, computer-aided software, etc., master the planning, design and calculation methods and processes of urban water supply pipe network system, exercise the level of design specification preparation, drawing expression and communication, cultivate the ability to combine theory and practice, analyze and solve engineering problems, and lay the foundation for relevant work after graduation.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in urban water supply network system planning, design and calculation methods and processes, and the ability to solve engineering practice problems.

Course objective 2: The ability to comprehensively consider social, economic, environmental and other constraints, and creatively propose new schemes, new technologies, new materials and other preliminary solutions to the design of water supply pipe network system.

Course Objective 3: Master the writing format and depth requirements of the design specification text, and master the skills and methods of drawing engineering drawings and expressing results.

Formulated by: Wang Cai, Director of the Department of Literature (Office) Review: Wang Aihe College Leader

Review: Li Yongsuo

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Syllabus for the design of the drainage network course

Course name	Drainage network course design	Course number	9031415280						
English name	Drainage Plumbing System Course Project								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/> , and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Engineering drawing, water supply and drainage pipe network system (2), AutoCAD basics, water supply and drainage engineering computer application basics, etc								
Teaching materials and reference materials	References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

"Course Project of Drainage Pipe System" This course is a concentrated practical teaching session after the core compulsory course "Water Supply and Drainage Network System (2)". The purpose of the course is to consolidate the theoretical knowledge learned in the comprehensive application of "Water Supply and Drainage Network System (2)", make reasonable use of relevant standards, specifications, design manuals, computer-aided software, etc., master the design and calculation methods and processes of drainage pipe network system, exercise the level of design specification preparation, drawing expression and communication, cultivate the ability to combine theory and practice, analyze and solve engineering problems, and lay the foundation for relevant work after graduation.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in the design and calculation methods and processes of urban sewage pipe network system and stormwater pipe system, the ability to solve engineering practice problems, and the

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establishment of good professional ethics and social responsibility.

Course Objective 2: The ability to comprehensively consider social, economic, environmental and other constraints, and creatively propose new schemes, new technologies, new materials and other preliminary solutions to the design of urban drainage pipe network system. Cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country.

Course Objective 3: Master the writing format and depth requirements of the design specification text, and master the skills and methods of drawing engineering drawings and expressing results.

Formulated by: Yan Hengzhen, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Get to know the Practicum (2) syllabus

Course name	Understanding Internship (2)	Course number	9021615290		
English name	Cognitive exercises (2).				
Applicable majors	Water Supply and Drainage Science and Engineering				
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>				
Offering unit	School of Municipal and Surveying Engineering				
Total credit hours	1 week	Credits 1,0	Theoretical hours 0	Practical hours 1 week	Computer-based hours 0
Prerequisites	Water Quality Engineering (1), Water Quality Engineering (2), Water Engineering Construction, Water Process Equipment Basics, Water Engineering Economics and Budget Estimation				
Refer to textbooks	"Water Supply Engineering", "Water Pollution Control Engineering", "Water Engineering Construction", "Water Process Equipment Foundation", "Water Engineering Economy and Budget Estimation"				

1. Course Introduction

Cognition practice (2). It is an important practical part of the undergraduate study of water supply and drainage science and engineering, through the understanding and practice, so that students have an in-depth understanding and mastery of water supply and drainage engineering, improve students' understanding of the role and status of water supply and drainage engineering in the development of national economy and social and economic construction, enhance perceptual understanding, and stabilize professional thinking. Through teaching visits, special lectures and other means, students can deeply grasp the layout of various pipelines in the building, the internal water supply, drainage, fire protection and other systems in the building, the basic process of water treatment process and the form and characteristics of the structure, etc., and fully understand the main content of the planning, design, construction and management of water supply and drainage projects, as well as the construction procedures and management procedures of the project. Linking theory with practice, and combining the learned professional knowledge with engineering practice better and more fully.

2. The teaching objectives of the course and the graduation requirements supported by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Familiar with the overall layout, elevation layout and actual production process of urban water supply treatment plant, familiar with the overall layout, elevation layout and types, operation and maintenance management methods of various treatment structures (facilities) of urban sewage treatment plants, familiar with the basic composition of water supply, drainage, fire protection and other systems in the building and

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the layout and requirements of related equipment, and have good humanities and social science literacy and strong sense of social responsibility. Ability to understand and comply with engineering ethics and norms in engineering practice in the field.

Course Objective 2: To be able to take on the roles of individual, team member and leader in a multidisciplinary context.

(2) Teaching methods

Mainly using the method of on-site teaching, through the on-site visit of water supply treatment plants, sewage treatment plants and building water supply, drainage and fire protection systems, and the on-site explanation and Q&A of the leading teachers, special lectures are arranged according to the actual situation. The special lectures mainly answer questions and expand knowledge about new processes and technologies that are not fully documented or not well understood in the process of understanding the internship.

Formulated by: Deng Jie, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of water treatment course design (including practical ability training of waterworks engineering).

Course name	Water treatment course design (including waterworks engineering practice ability training).			Course number	9021415300				
English name	Water treatment plant design								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input checked="" type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2,0	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Hydraulics, Pumps and Pumping Stations, Water Analytical Chemistry, Water Quality Engineering (1), etc								
Teaching materials and reference materials	Course textbook: Building Water Supply and Drainage Engineering (7th Edition), edited by Wang Changchang, China Architecture & Building Press. References: design manuals, specifications, related textbooks, etc								

1、 Course Description:

Design of Water Treatment Plant (including Practical Ability Training of Water Treatment Plant Engineering)) is the curriculum design of the "Water Quality Engineering I." course of the Water Supply and Drainage Science and Engineering major. The purpose of this course is to digest and consolidate the basic theories and knowledge of Water Quality Engineering I., to learn the methods and processes of applying theoretical knowledge to practical engineering, to cultivate the ability to combine theory and practice, analyze and solve problems, to improve students' design calculation skills and ability to write design specifications, and to lay a foundation for the study of relevant design practice links and related work after graduation.

2、 Course Teaching Objectives

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: Master the relevant design specifications of water supply and drainage, and be able to design reasonable solutions for complex engineering problems such as urban water supply plants;

Course Objective 2: Understand the general process of water plant design, master the skills of design calculation and the writing method of design texts, master the skills and methods of drawing engineering drawings, and be able to clearly express personal design ideas and views.

Formulated by: Zhang Chun/Li Yuanping Director of the Department (Office) Review: Wang Aihe College Leader
Review: Li Yongsuo

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Syllabus of sewage treatment course design (including practical ability training of sewage treatment plant engineering).

Course name	Sewage treatment course design (including practical training of sewage treatment plant engineering)	Course number	9021415310						
English name	Sewage treatment course design (including training on practical ability of sewage treatment plant engineering)								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Hydraulics, Pumps & Pumping Stations, Engineering Drawing, Water Quality Engineering (2)								
Teaching materials and teaching resources	Course materials: Gao Tingyao, Gu Guowei, Zhou Qi. Water Pollution Control Engineering (Fourth Edition, Volume II)[M].Beijing:Higher Education Press,2015 References: relevant standards, specifications, design manuals and teaching materials, etc								

1、 Introduction To course design

Course Design of Sewage Treatment (including Engineering Practice Ability Training of Sewage Treatment Plant). This course is a concentrated practical teaching session after the core compulsory course "Water Quality Engineering (2)". The aim of the course is to consolidate students' understanding of the theoretical knowledge learned in Water Quality Engineering (2) and apply it comprehensively to practical engineering. In the course design process, students need to analyze the original materials and design requirements in the design task book, combine professional knowledge and theory, make reasonable use of relevant standards, specifications, design manuals, computer-aided software, etc., put forward effective and reasonable design schemes for the complex problems of urban and rural water engineering, design the water treatment system process to meet specific needs, and be able to reflect the sense of innovation in the design process, consider social, health, safety, legal, cultural and environmental factors, and determine the treatment process. Combined with industry norms, complete the design calculation of the processing structure and complete the drawing. Through the learning and practice of this course, students will be proficient in the relevant processes of sewage treatment process design, and exercise their level of design specification writing, drawing expression and communication, so as to cultivate students' ability to combine theory and practice, analyze and solve engineering problems, and lay a foundation for related work after graduation.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Proficiency in the calculation methods and processes of sewage treatment process design, the ability to solve engineering practice problems, and the establishment of a good sense of professional ethics and social responsibility.

Course objective 2: The ability to comprehensively consider social, economic, environmental and other

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constraints, and creatively propose new schemes, new technologies, new materials and other preliminary solutions to the design of sewage treatment processes. Cultivate students' engineering ethics and morality, mobilize students' enthusiasm for learning, and establish the belief of serving the country and the people.

Formulated by: Yan Hengzhen, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Syllabus of Production Practice

Course name	Production Internship					Course number	9021615320			
English name	Production practices									
Applicable majors	Water Supply and Drainage Science and Engineering									
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>									
Offering unit	School of Municipal and Surveying Engineering									
Total credit hours	14 weeks	Credits	9.0	Theoretical hours	0	Practical hours	14 weeks	Computer-based hours	0	
Prerequisites	Pumps and pumping stations, water supply and drainage network systems, water quality engineering, building water supply and drainage, water engineering construction, etc									
Teaching materials and reference materials										

1、 Course Description:

Production PracticeIt is an important practical course compulsory for water supply and drainage science and engineering, which aims to deepen and consolidate the theoretical knowledge learned by students, expand the scope of professional knowledge, and improve practical operation ability on the basis of mastering the basic knowledge and some professional knowledge of water supply and drainage science and engineering. Through visits and production practices, students learn and master the design characteristics, process flow, main design parameters, selection basis and advantages and disadvantages of each structure, problems and improvement measures in operation of waterworks and sewage treatment plants. By learning the basic operation skills of construction technology and construction organization and production management, students will understand and master the design methods and construction methods of building water supply and drainage engineering and municipal water supply and drainage pipeline engineering. Through production practice, students will build a bridge between theory and engineering practice, so that students can initially contact the society, enhance their ability to communicate with others, develop independent learning and practical innovation ability, and lay the foundation for subsequent graduation comprehensive training and going to work.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

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Course objective 1: To be able to obtain certain production experience in the design characteristics, process flow, main design parameters, selection basis and advantages and disadvantages of each structure, problems and improvement measures in operation, construction skills and other aspects according to the requirements of production practice tasks, strengthen the sense of responsibility, cultivate the professional ethics of water supply and drainage engineers, and establish the belief of serving the country.

Course Objective 2: Be able to choose appropriate methods to solve problems encountered in engineering practice, master the development trend and dynamics of water supply and drainage science and engineering discipline in engineering practice, and have the ability to be good at communication and adapt to social and technological development.

Course Objective 3: Be able to standardize the writing of production practice reports, and accurately and effectively express professional opinions through presentations, defenses, etc.

(2) Teaching methods

1. Students and teachers should contact the internship unit together, and students are required to complete only one direction of internship content, or multi-direction internship can be carried out according to the actual situation, but the internship time in each direction shall not be less than 6 weeks.

2. Each student is required to have an off-campus internship instructor with an intermediate title or above and an on-campus instructor. Fill in the internship content, internship summary and attendance sheet every day.

Formulated by: Li Yuanping, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Metalworking Internship Syllabus

Course name	Metalworking internship	Course number	9021715330						
English name	Metalworking practices								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/> , self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/> , and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2,0	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Building water supply and drainage engineering, water supply and drainage pipe network system, water quality engineering, etc								
Teaching materials and reference materials									

1、 Course Description:

"Metalworking Practice" is a practical teaching session, through which the following objectives are achieved:

1. Through this training, understand the characteristics and application fields of various pipe types in pipeline engineering, understand the shape and structure of various fittings, master their functions and functions, and be familiar with the connection methods of various pipe fittings;

2. Understand the composition, structure and basic installation methods of various pipeline accessories and pumps, master the use of dry powder fire extinguishers, further cultivate students' basic operation skills on the basis of professional theoretical teaching courses, and help students improve the application ability of construction pipeline engineering;

3. Through observation, inquiry, analysis and discussion in the training, students will develop their initiative and enthusiasm in work and study, and cultivate students' ability to comprehensively analyze problems and solve practical engineering problems.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be able to assume the roles of an individual, a team member and a person in charge in the process of practice;

Course objective 2: Be able to write internship reports according to the specific content of the training, and be able to clearly express personal opinions, and have the initial ability of engineering communication and exchange.

Formulated by: Deng Yumei, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Graduation Internship Syllabus

Course name	Graduation Internship	Course number	9021615340						
English name	Graduation Internship								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses: <input type="checkbox"/> basic courses, <input type="checkbox"/> professional core courses (electives <input type="checkbox"/> , compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	2 weeks	Credits	2	Theoretical hours	0	Practical hours	2 weeks	Computer-based hours	0
Prerequisites	Pumps & Pumping Stations, Water Supply & Drainage Network Systems, Water Quality Engineering, Building Water Supply & Drainage, Civil Engineering Fundamentals								
Teaching materials and teaching resources									

2、 Project Brief Introduction

"Graduation Practice" is one of the important practical teaching links of water supply and drainage engineering, its purpose is to make students more familiar with and master professional knowledge, consolidate and enrich the content of the professional courses they have learned, and be familiar with the working principle, process design and calculation of various systems of municipal water supply and drainage and building water supply and drainage engineering. Understand the engineering design process and the design depth and requirements of each design stage, and cultivate students' ability to comprehensively use engineering knowledge and professional knowledge to solve practical engineering problems.

3、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through this course, students will be equipped with the following abilities:

Course Objective 1: Be able to write graduation internship reports in a standardized manner, be proficient in using words and drawings to clearly express personal views, and be able to effectively communicate and exchange with peers in the industry on their own views and ideas, cultivate students' professionalism, and establish a good sense of professional ethics and social responsibility.

Course Objective 2: To cultivate students' ability to obtain the latest scientific and technological frontiers, engineering technology and engineering management of water supply and drainage science and engineering through independent learning methods such as literature inquiry and academic exchange, and to have the ability to continuously learn and apply to development, and to establish the belief of serving the country.

(2) Teaching methods

Mainly using the method of on-site teaching, through the production, management and on-site explanation and Q&A of the internship unit (or internship site), and the symposium or Q&A meeting can be arranged according

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to the actual situation. The special lectures mainly answer questions and expand knowledge about new processes and technologies that are not fully documented or not well understood in the process of graduation internship.

Formulated by: Jiang Haiyan, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo

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Comprehensive syllabus for graduation

Course name	Graduation comprehensive training				Course number	9021515350			
English name	Comprehensive training in water supply and drainage science and engineering								
Applicable majors	Water Supply and Drainage Science and Engineering								
Nature of the course	General education courses <input type="checkbox"/> , subject foundation courses <input type="checkbox"/> major core courses (elective <input type="checkbox"/> compulsory <input type="checkbox"/>), self-development courses (compulsory <input type="checkbox"/> electives <input type="checkbox"/>), and intensive practice courses <input checked="" type="checkbox"/>								
Offering unit	School of Municipal and Surveying Engineering								
Total credit hours	13 weeks	Credits	13,0	Theoretical hours	0	Practical hours	0	Computer-based hours	0
Prerequisites	Pumps and pumping stations, water supply and drainage network systems, water quality engineering, building water supply and drainage engineering, etc								
Teaching materials and reference materials									

1、 Course Description:

The graduation comprehensive training is a core course of water supply and drainage science and engineering, and it is the last practical teaching link during students' study at the school. Through the selection of topics, data review and use schemes, the writing of optimization calculations, and the defense of drawings in the graduation comprehensive training, students will be trained to comprehensively use their knowledge to analyze and solve problems in water supply and drainage engineering.

2、 The teaching objectives of the course and the graduation requirements underpinned by it

1. Teaching objectives of the course

Through the theoretical teaching and training of this course, students will be equipped with the following abilities:

Course Objective 1: To be able to formulate a reasonable design plan according to the requirements of the graduation project task, consider and evaluate the impact of the design on social, health, safety, legal, cultural and environmental factors, propose solutions, demonstrate the rationality of the solutions, and optimize the design solutions.

Course Objective 2: To be able to select appropriate tools to carry out corresponding design calculations for design projects, write design calculations and drawings, and analyze and judge the design calculation results; or carry out research on the subject and reach certain conclusions on the research. Able to accurately and effectively express professional opinions through presentations, defenses, etc.

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Course Objective 3: To master the development trends and dynamics of water supply and drainage science and engineering, integrate advanced technology into design, and have the ability to adapt to social and technological development.

Formulated by: Zhang Chun, Director of the Department (Office) Review: Wang Aihe College Leader Review: Li Yongsuo