Attachment B-1: All course outlines for the Water Supply and Drainage major

# Syllabus for Teaching Ideological and Moral Cultivation and Legal Basics

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Moral Cultivation and Legal Basics | | | | Course Number | | 9123311031 | | |
| English name | Thinking of Ethics and Legal Basis | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Compulsory) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Marxism College | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 40 | practical study hours | 8 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | "Textbook on Ideological and Moral Cultivation and Legal Basics" compiled by the Higher Education Press | | | | | | | | |

## 1. Course Introduction

《Thinking of Ethics and Legal Basis》（Thinking of Ethics and Legal Basis）This course addresses the ideological, moral, and legal issues faced by college students during their growth process, conducting education on Marxist worldview, outlook on life, values, moral views, and legal awareness, guiding college students to enhance their ideological and moral quality as well as their legal literacy, and to grow into a new generation that consciously undertakes the great task of national rejuvenation.

## 2.This courseteaching objectives and teaching methods

(1) Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire 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 individuals of the era with ideals, skills, and a sense of responsibility.

Course Teaching Objective 2: To possess a good humanistic and social science literacy and a strong sense of social responsibility, and to be

able to understand and comply with engineering ethics and standards in engineering practice within this field.

Course Teaching Objective 3: In practical teaching, focusing on cultivating college students' core socialist values, through our school's "Five Micro" practical teaching model, including micro photo display activities and provincial college students' research learning competitions,to practice the core socialist values.

**(2)Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions and Q&A, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Chu JingDepartment (Office) Head Review:Chu JingCollege Leadership Review:He Junxin

# Syllabus for Teaching the Outline of Modern and Contemporary Chinese History

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Outline of Modern and Contemporary Chinese History | | | | | Course Number | | 9124311041 | |
| English name | Outline of Modern and Contemporary History of China | | | | | | | | |
| Applicable majors | All undergraduate majors in the school | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | MarxismAcademy | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 40 | practical study hours | 8 | Machine learning hours | 0 |

| | |
|---|---|
| Prerequisite courses | Ideological and Moral Cultivation and Legal Basis |
| Textbooks and reference materials | Textbook: "Outline of Modern and Contemporary Chinese History" Higher Education Press (2018 edition).<br>References: "Selected Works of Marx and Engels," "Selected Works of Mao Zedong," documents on modern Chinese history, related textbooks, etc. |

## CourseIntroduction

Outline of Modern and Contemporary History of China is one of the required ideological and political theory courses for undergraduate students in national higher education institutions. It is a public foundational course that mainly teaches the history of resisting foreign invasion, striving for national independence, achieving people's liberation, and realizing national prosperity and people's wealth since modern times in China, aiming to achieve the effectiveness of ideological and political theory courses from a historical perspective.

Course introduction

Outline of Modern and Contemporary History of China is one of the ideological and political theory courses that undergraduate students in institutions of higher education must learn. As a public basic course, Outline of Modern and Contemporary History of China teaches Chinese modern and contemporary history, mainly covering resistance against foreign aggression, the struggle for national independence, the realization of people's liberation, and the prosperity and strength of the nation and its people.’s liberation, thriving and powerful nation and people’s rich. This course aims to achieve the effects of an ideological and political theory course from a historical perspective.

## Course teaching objectives andthe supported graduation requirements

**(1) Course Teaching Objectives**

Through the theoreticaland practicalteaching of this course, students will possess the followingqualities andabilities:

**Course Objectives1：** Understand the arduous exploration and tenacious struggle of the Chinese people against foreign invasion, striving for national independence and liberation since modern times, as well as the lessons learned from this process， understand the overall picture of history and its basic lines 索 ; understand the historical process of the Chinese people's pursuit of wealth and strength, the liberation and development of productive forces, and the path towards modernization since modern times; understand the historical inevitability of the choice of Marxism, the Communist Party of China, the socialist path, and reform and opening up by history and the people since modern times.

**Course Objectives2:**“Using history as a mirror,” cultivate students' ability to study and research modern Chinese history using the standpoint, viewpoint, and methods of dialectical materialism and historical materialism, as well as their ability to identify, analyze, and solve problems; foster students' rational thinking about contemporary society, their ability to discern the direction of social development, and their comprehensive analytical skills.

**Course Objectives3:**Educate students to inherit and promote the traditions of patriotism and revolution, to carry forward the national spirit centered on patriotism and the spirit of the times centered on reform and innovation, and to enhance national self-esteem, self-

confidence, pride, and a sense of historical responsibility in realizing the great rejuvenation of the Chinese nation, the "Chinese Dream."

**Course Objectives4:**Enhance students' belief and confidence in steadfastly following the path of socialism with Chinese characteristics under the leadership of the Communist Party of China, guided by Marxism, through reform and opening up.

**(2)Teaching Methods**

1.Theoretical Teaching

To master this course, it is necessary to combine the study of important scientific works by Comrade Mao Zedong and other leaders, important party documents, and textbooks; to combine theoretical learning with understanding of history; and to combine classroom instruction with student practice. Therefore, this course requires teachers to have a solid theoretical foundation, the ability to continuously learn, and to employ flexible and diverse teaching methods tailored to students from different professional backgrounds, so that they can confidently manage the classroom.

In addition, the application of multimedia modern teaching technology is also essential, as it is a public course that often involves large class teaching with many students and a big classroom. Secondly, because it requires "using history to discuss issues," a large amount of historical data is needed for guidance. Therefore, using multimedia technology in teaching allows for a large amount of information, broadens perspectives, and makes full use of learning resources.

2.After classexercises

Eachtopic is assigned corresponding exercises, including discussion questions and Q&A, to deepen understanding and mastery of the content taught in class, and to cultivate students' abilities to think independently, analyze, and solve problems.

3.Special Discussion

According to the teaching content， arrangegroup discussions, book sharing, etc., to fully stimulate students' interest in active learning。

Formulated by:Liu HengshanDepartment (Office) Director Review:Liu HengshanCollege Leadership Review:He Junxin

# Syllabus for Teaching the Basic Principles of Marxism

| | | | |
|---|---|---|---|
| Course Name | Basic Principles of Marxism | Course Number | 9121311011 |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| English name | Fundamental Principles of Marxism | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required£) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | MarxismAcademy | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 40 | practical study hours | 8 | Machine learning hours | 0 |
| Prerequisite courses | Ideological and Moral Cultivation and Legal Basis, Outline of Modern and Contemporary Chinese Historyetc. | | | | | | | | |
| Textbooks and reference materials | Course textbook: "Introduction to the Basic Principles of Marxism" Higher Education Press (2018 edition).<br>References: "Selected Works of Marx and Engels," "Xi Jinping on Governance," related textbooks, etc.. | | | | | | | | |

## CourseIntroduction

“The Basic Principles of Marxism” (abbreviated as “Principles”) is a compulsory course for undergraduate students in higher education institutions. The goal and task of the course are to help college students understand the origin of the world from an ontological perspective, correctly recognize the basic theories of materialism and dialectics; understand the epistemological perspective of the dialectical materialist approach to knowledge, correctly recognize the principles of truth and value and their unified highest realm——truth, goodness, and beauty; understand the laws of human historical development from the perspective of social history or historical philosophy, especially the basic laws of capitalist and socialist economic operations, correctly recognize the future trends of economic globalization and human social development, and establish a firm belief in socialism with Chinese characteristics.

## Course Teaching Objectives andMethods

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Familiarize with the positions, viewpoints, and methods of Marxism, and be able to apply the basic principles of Marxism to analyze social historical phenomena and establish a sense of social responsibility.

**Course Objectives2:**Familiarize with the Marxist view of nature, clearly recognize that humans are products of the natural world, that humans have developed within and alongside nature, and establish the concept of harmonious coexistence between humans and nature.

**Course Objectives3:**Familiarize with the materialist view of history, understand the unity of the individual and society, focus on recognizing and grasping the roles of certain groups and individuals from specific social relationships, exert the subject's role, and cultivate team awareness.

**Course Objectives4:**To view the new situations and problems arising in the current capitalist society correctly and rationally, to firmly uphold the ideal and belief in building socialism with Chinese characteristics, to adhere to the path of socialism with Chinese characteristics, and to consciously establish the grand ideal of communism.

### (2) Teaching Methods

This course is a theoretical course that mainly applies the basic principles and methods of Marxist dialectical materialism and historical materialism during the teaching process. It uses multimedia teaching methods, including thematic explanations, problem discussions, and case introductions, while also incorporating homework and micro-story practical activities to provide students with systematic education in Marxist theory.,It helps students master the worldview and methodology of Marxism,establish a Marxist outlook on life and values, and trains students to observe and analyze problems using the worldview and methodology of Marxism,cultivating and enhancing students' ability to analyze and solve practical problems using Marxist theory, and establishing students' ideal beliefs in building socialism with Chinese characteristics,consciously adhering to the party's basic theory, basic line, and basic program to lay a solid theoretical foundation.

The following methods were used in teaching:

1.Thematic teaching method. Based on the principles of value guidance and problem orientation, the content of the textbook is summarized and designed into9topics.

2.Case-based teaching method. This course has a wealth of theory, and some of the content is very abstract and difficult to understand. Using case studies can effectively stimulate students' interest and enthusiasm for learning.

3.Question Discussion Method. The topic names appear in the form of questions, and the teaching process will also unfold through case studies or current hot topics, leading to discussions both inside and outside the classroom. This course has an online platform, allowing discussions to be tracked both online and offline, reinforcing and digesting the knowledge learned.

Formulated by:Deng FengxiangDepartment (Office) Director Review:Deng FengxiangCollege Leadership Review:He Junxin

# Syllabus for Teaching 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 | Mao Zedong Thought and Introduction to the Theoretical System of Socialism with Chinese Characteristics | | |
| Applicable majors | All undergraduate majors in the school | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Offering Unit | MarxismAcademy | | | | | | | | |
| Total study hours | 80 | credit | 5.0 | theoretical study hours | 72 | practical study hours | 8 | Machine learning hours | 0 |
| Prerequisite courses | Ideological and Moral Cultivation and Legal Basis, Principles of Marxist Philosophy, Outline of Modern and Contemporary Chinese History | | | | | | | | |
| Textbooks and reference materials | Textbook: "Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics" Higher Education Press (2018 edition).<br>References:Selected Works of Leaders、 Party History Documents、 related textbooks, etc. | | | | | | | | |

## CourseIntroduction

《Mao Zedong Thought and Introduction to theoretical system of socialism with Chinese characteristics》（Mao Zedong Thought and Introduction to theoretical system of socialism with Chinese characteristics） isageneralcourse on ideological and political theoryfor all undergraduatemajors,focusing on the theoretical achievements formed in the process of the sinicization of Marxism and the basic theories, basic routes, and basic strategies for upholding and developing socialism with Chinese characteristics in the new era.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 continuously promoting the integration of the basic principles of Marxism with China's specific realities; the basic theories, basic routes, and basic strategies for upholding and developing socialism with Chinese characteristics in the new era fully reflect the theoretical guidance and strategic deployment for building a modern socialist country. The teaching of this course is an important part of strengthening the ideological and political theory education of college students in the new era, and itsmain task isto helpstudentssystematically master the theoretical knowledge of sinicized Marxism and enhance their confidence in the path, theory, system, and culture of socialism with Chinese characteristics.。

## Course Teaching Objectives andMethods

### 1Course Teaching Objectives

Through the theoreticaland practicalteaching of this course,helpstudentssystematically master the theoretical knowledge of Marxism with Chinese characteristics, and enhance their confidence in the path, theory, system, and culture of socialism with Chinese characteristics:

**Course Objectives1：** Have an accurate understanding of the theoretical achievements formed in the process of the Sinicization of Marxism;

**Course Objectives2:**A profound understanding of the historical process, historical changes, and historical achievements of the revolution, construction, and reform led by the Communist Party of China.

**Course Objectives3:**A thorough understanding of the basic theories, basic routes, and basic strategies upheld by the Communist Party of China in the new era;

**Course Objectives4:**Enhance the ability to recognize, analyze, and solve problems using the standpoint, viewpoint, and methods of Marxism;

**Course Objectives5:**Enhance recognition of the Party and the country's major policies and guidelines, and strengthen confidence in the path, theory, system, and culture of socialism with Chinese characteristics.

**(2) Teaching Methods**

1.Theoretical Teaching

(1)ClassTeaching

Mainly based on classroom lectures,supplemented by appropriate discussions to enhance learning outcomes.

(2) After-class exercises

Each chapter includes corresponding exercises, including discussion questions and Q&A, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

（3）Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Practical teaching

（1）Teaching Form: Hunan City UniversityIdeological and Political Theory Course "Five Micro" Practical Teaching Model“Micro Video” Exhibition Competition Activity。

（2）Event Time:During the course teaching (divided into preliminary, semi-final, and final rounds)。

（3）Activity Theme: Cultivating and Practicing the Core Socialist Values (Patriotism, Dedication, Integrity, Friendliness) Choose any one word as the theme of the work.

（4）Project requirements: Students in natural classes8-10people per group, project duration3-5minutes, must closely adhere to the theme， the projectshould haveinnovation, artistry, and technicality.

（5）Competition Schedule:1-2Weeks for teachers to guide students in groupingworksand determining topics,by the6th weekFridaybefore, each class's study committeewill assist the teacherin collectingworks;in the7th week, preliminary rounds will be held in each classroom, with each natural class democraticallyselecting1 best work to qualify for the semi-finals;in the8th week, thequalified semi-final workswill be uploaded to the thematic learning website, accepting likes from all students in the introductory course;based on this,experts will review and select16works to qualify for the finals,and in the12th week, at thecompetition display site,100public judges will vote and5judges will score to comprehensively determine the finalranking,and awardprizes,certificates of honoras forms of rewards.

Formulated by:Wang YanghuaDepartment (Office) Director Review:Huang HuilianCollege Leadership Review:He Junxin

# Syllabus for Situation and Policy Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Situation and Policy | | | | | Course Number | 9125111050 | | |
| English name | Situation and policy | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Compulsory) Independent Development Course (Compulsory£ElectiveR) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Marxism College | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 32 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Course Materials:"College Students' Situation and Policy Course" Editorial Team, Xinhua Publishing House<br>Reference materials:“Situation and Policy” special lecture manuscript by the Propaganda Department Current Affairs Report Magazine | | | | | | | | |

## 1. Course Introduction

"Situation and Policy"(Situation and policy)The course is an important component of ideological and political theory courses in higher education, serving as the main channel and platform for educating students on situation and policy, and is a required course for every university student. It is guided by Marxism-Leninism, Mao Zedong Thought, and the theoretical system of socialism with Chinese characteristics, based on the training objectives of higher education institutions, closely integrating domestic and international situations, and addressing the ideological realities of university students. It provides a relatively systematic ideological and political education course on the Party's lines, principles, and policies for university students. The teaching is primarily conducted through lectures by teachers, supplemented by practical teaching, and employs various teaching methods and means such as thematic lectures, multimedia audio, and video to enhance the timeliness of the instruction.

## 2.Course Teaching Objectives andSupported Graduation Requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Teaching Objective 1:To comprehensively and deeply study and implement the spirit of the 19th National Congress of the Communist Party, to help college students understand and grasp the international and domestic situation as well as national policies, to broaden students'

horizons, and to enhance their ideological and theoretical literacy and policy level.

Course Teaching Objective 2: Guide college students to unify their thoughts, gather strength, and steadfastly follow the path of socialism with Chinese characteristics, striving to learn for the comprehensive construction of a moderately prosperous society and the great rejuvenation of the Chinese nation, the "Chinese Dream".

Course Teaching Objective 3: Familiarize with the basic positions, viewpoints, and methods of Marxism, and be able to apply the basic principles of Marxism to analyze social historical phenomena and establish a sense of social responsibility.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives.

Ten minutes of news commentary before class.

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

Formulated by:Yao YanxiaDepartment (Office) Head Review: Yao YanxiaCollege Leadership Review: He Junxin

# College English (1) Teaching Syllabus

| | | | |
|---|---|---|---|
| Course Name | College English (1) | Course Number | 9054311011 |
| English name | College English (1) | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education CourseRDisciplinary Foundation Course ☐ Core Major Course (Elective ☐ Required ☐ ) Independent Development Course (Required£Elective £) Concentrated Practice Course ☐ | | |
| Course Offering Unit | School of Humanities/Department of English Language | | |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total Study Hours | 48 | credit | 3.0 | theoretical study hours | 48 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | High School English | | | | | | | | |
| Textbook and Teaching resources | Course Textbook: “New Target College English Comprehensive Course 1” (Student Book), Chief Editor: Shu Dingfang, Editors: Liu Zhengguang, Peng Peilu, Shanghai Foreign Language Education Press, April 2017.<br>"New Horizons College English Reading and Writing Course 1" (Third Edition), Chief Editor: Zheng Shutang, Editors: Ding Yaping, Wu Yong, Foreign Language Teaching and Research Press, June 2015.<br>"New Horizons College English Listening and Speaking Course 1" (Third Edition), Chief Editor: Zheng Shutang, Editor: Ding Yaping, Foreign Language Teaching and Research Press, July 2017.<br>Reference materials: Various university English Level 4 exam preparation materials. | | | | | | | | |

**1. Course Introduction**

《大学英语（1）》（College English (1)） is a required general education course for undergraduate students majoring in non-English fields. It focuses on basic language knowledge, basic language skills, language learning strategies, and intercultural communication, guided by advanced foreign language teaching theories. The course integrates high-quality educational resources and combines various teaching models and methods into a cohesive teaching system. The teaching objective of this course is to cultivate students' comprehensive English application abilities, enhance their awareness and ability in intercultural communication, develop their autonomous language learning skills, and improve their overall cultural literacy, enabling them to become versatile talents that meet the needs of the new era of socialist economic development with Chinese characteristics and international cultural and technological exchanges.

**2. Course Teaching Objectives andSupported Graduation Requirements**

**1Course Teaching Objectives**

Through the theoretical teaching of this course, students will acquire basicEnglish languageknowledge andapplicationskills 。 The specificcourseobjectives are as follows:

Can understand spoken expressions related to personal interests at a normal speed (about 100-140 words per minute), such as speeches, non-professional lectures, news reports, etc. Can distinguish between main and secondary information based on discourse features and understand the main content. Can understand conversations on familiar topics and grasp the speaker's viewpoints and intentions.

Can understand simple language and different types of materials, such as short stories, letters, etc., and extract detailed information and summarize the main ideas.Can understand simple language and a wide range of narrative and argumentative texts, distinguish between facts and opinions, and make simple inferences. Can understand more complex materials by analyzing sentence and text structure, and comprehend the relationships between meanings. Reading speed reaches 70-100 words per minute.

Can verbally express personal needs and wishes, and choose appropriate ways of expression based on the communication partner, such as the level of politeness. Can communicate on topics of interest and respond in a timely manner to ensure smooth communication. Can narrate short stories or personal experiences in an organized manner. Can briefly introduce or explain common activities or scenes in daily life and work, such as sports, leisure activities, and scenic spots.

Can express one's views on familiar topics in writing and support them with certain evidence, demonstrating strong persuasiveness.Can narrate personal experiences and activities around them, such as campus events, using common rhetorical techniques, with smooth sentences and complete narratives. Can engage in simple discussions about social and cultural topics, such as traditional festivals and customs, through social media, such as emails and web pages. Possesses effective communication and teamwork skills.

Can accurately understand information using grammatical knowledge such as sentence structure, tense, and voice. Can use appropriate vocabulary to describe things, define concepts, etc., with proper pronunciation and intonation in oral expression. Can effectively organize information based on communication purposes using basic discourse knowledge.

Can understand the intentions expressed by others in general social interactions. Can communicate with others on familiar topics, using appropriate language forms and communication strategies according to specific communication contexts, politely and tactfully expressing a wide range of intentions such as apologies, complaints, and gratitude, adhering to important communication norms, and maintaining good interpersonal relationships.

Can translate simple paragraphs in familiar themes or daily life language, reproducing the main information of the original text. Master about 4,000 words and 700 phrases, with approximately 2,000 active vocabulary words that can be proficiently used in both oral and written expression. Possess basic syntactic knowledge and application ability,able to use complete simple sentences, understand and grasp the basic structure of complex sentences, and use various verb tensesfor expression.

**(2) Teaching Methods**

1. Classroomlearningandindependent study after classare equally important

Using a blended teaching model of online and offline,with classroomlearningas the main focus, part of the content is based onself-directed learning after classwhile also arrangingpost-class tests and activities.

2. Exercises

In conjunction with the teaching units of the textbook,assign corresponding exercises, includingcontent that covers all teaching objectives, deepening understanding and mastery of the classroomlearningcontent, and cultivating students' ability to independentlyreview, consolidate classroom knowledge points, and flexibly apply language.

3.Test

In conjunction with classroom teaching, organizetests related to teaching objectives.

4.Mock Exam

Organize a simulated College English Test Band 4, assess students' learning situation, and adjust the response measures for the Band 4 exam.

Formulated by:Yin SuiqiongDepartment (Office) Head Review:Liu PingpingCollege Leadership Review:Zhou Ruiying

# Syllabus for College English (2)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | College English (2) | | | | | Course Number | 9054311021 | | |
| English name | College English (2) | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course Disciplinary Foundation Course ☐ Core Major Course (Elective ☐ Required ☐ ) Independent Development Course (Required Elective ) Concentrated Practice Course ☐ | | | | | | | | |
| Course Offering Unit | School of Humanities / Department of English Language | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 48 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | College English (1) | | | | | | | | |
| Textbooks and reference materials | Course materials: Liu Zhengguang, Lang Jianzhong. "New Target College English Comprehensive Course2". Shanghai: Shanghai Foreign Language Education Press,2017.<br>Zheng Shutang. "New Horizons College English Reading and Writing Course2" (Third Edition). Beijing: Foreign Language Teaching and Research Press,2015.<br>Zheng Shutang. "New Horizons College English Listening and Speaking Course2" (Third Edition). Beijing: Foreign Language Teaching and Research Press,2017.<br>Reference materials: Relevant materials for the College English Test Band 4 | | | | | | | | |

## CourseIntroduction

《College English (2）（College English (2)） is a required general education course for undergraduate students majoring in non-English disciplines. It focuses on basic language knowledge, basic language skills, language learning strategies, and intercultural communication, guided by advanced foreign language teaching theories, integrating high-quality educational resources, and combining various teaching models and methods into a cohesive teaching system. The teaching objectives of this course are to enhance students' comprehensive English application abilities, strengthen their awareness and skills in intercultural communication, improve their autonomous language learning capabilities, and further elevate their overall cultural literacy, cultivating students to become versatile talents that meet the needs of the new era of socialist economic development with Chinese characteristics and international cultural and technological exchanges.

## Course teaching objectives and the supported graduation requirements

### 1Course Teaching Objectives

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

**Course Objectives1：** Be able to understand spoken expressions on general topics at a normal speed (about120 ～ 150words/minute), grasp key points and details, clarify logical relationships such as cause and effect, contrast, and progression, and understand the basic cultural connotations of the discourse. When listening to or watching broadcasts and films on general topics, be able to comprehend the main content.

**Course Objectives2:**When reading materials with complex language and rich topics, such as those related to education, technology, and culture, be able to understand the main ideas, analyze language features, and grasp cultural connotations. Be able to comprehend complex argumentative materials, such as social commentaries and book reviews, and distinguish different viewpoints. Reading speed reaches100-120words per minute.

**Course Objectives3:**Be able to express opinions or communicate with others on daily life topics or familiar social hot issues verbally, clearly, in a structured and organized manner. Be able to briefly present personal insights on topics related to one's profession after preparation. Be able to engage in effective verbal communication or negotiation on daily matters such as business, travel, shopping, etc.

**Course Objectives4:**Can write short essays on topics of interest, with arguments and evidence, using various cohesive devices and maintaining semantic coherence. Can write reports related to their own field of expertise, such as book reports and research reports, with a complete structure. Can write common application documents, such as thank-you letters and meeting minutes, with correct formatting and language expression that meets requirements. Possesses effective communication and teamwork skills.

**Course Objectives5:**Be able to use relevant grammar and discourse knowledge to express oneself clearly in daily learning or work communication, basically conforming to the norms and requirements of the relevant styles. Be able to understand and use the expressive functions of common moods and intonations. Be able to understand the logical semantic

relationships between complex sentences or paragraphs. Be able to choose appropriate vocabulary to express opinions and engage in discussions on familiar topics. Be able to select appropriate sentence structures to achieve relevant communicative purposes.

**Course Objectives6:**To understand the viewpoints, emotions, attitudes, and intentions expressed by others in common social situations. To communicate with others on topics of mutual concern, selecting appropriate language forms based on the formality of the social context, expressing one's own viewpoints, emotions, and attitudes appropriately, being aware of cultural differences, and demonstrating the respect due to communication partners to achieve effective communication.

**Course Objectives7:**Can translate short, simple texts related to daily life, reproducing the main information of the original text. Can translate texts that describe spatial orientation and natural environments, with translations that are faithful and accurate. Can translate common indicative texts, such as signs and activity schedules, with complete information and clear meaning.

Course Objective 8:Master approximately 4500 words and 1000 phrases, with about 2500 active vocabulary words that can be proficiently used in both oral and written expression. Able to use various sentence structures, understand and grasp the meaning of long and complex sentences through syntactic analysis, and express using complex verb tenses.

**(2) Teaching Methods**

1. Equal emphasis on classroom learning and independent study after class

Use a blended teaching model of online and offline, with classroom learning as the main focus, while some content is based on self-study after class, and arrange for after-class tests and activities.

2. Exercises

Combine the teaching units of the textbook and assign corresponding exercises, including content that covers all teaching objectives, deepening understanding and mastery of classroom learning content, and cultivating students' ability to review independently, consolidate classroom knowledge points, and flexibly use the language.

3.Test

Organize tests related to teaching objectives in conjunction with classroom instruction.

4.Mock Exam

Organize a simulated College English Test Band 4, assess students' learning situation, and adjust measures to cope with the Band 4 exam.

Formulated by:Duan HuiDepartment (Office) Head Review:Liu PingpingCollege Leadership Review:Zhou Ruiying

# Syllabus for College English Extension Course (1)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University English Extension Course (1) | | | | Course Number | 9054311031 | | | |
| English name | Extended Course of College English1 | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective□Required□Self-Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of HumanitiesDepartment of College English Teaching | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | College English（1）, College English（2） | | | | | | | | |
| Textbooks and reference materials | Course Materials:1. New Trend University English Speaking Course (Volume 1 and 2), Chief Editor: Xiong Lijun, Commercial Press, July 2018;<br><br>References:1."New Century English Speaking Course 1-4" Chief Editor: Li Huadong, Foreign Language Teaching and Research Press, published in January 2014.2. College English Speaking, Chief Editor: Liu Yuanyuan, Higher Education Press, August 2016.3.Trendy Specialized English Speaking, Chief Editors: Zhang Xihua, Wang Lei, Fudan University Press, August 2012. | | | | | | | | |

## CourseIntroduction

"Extended Course of College English (1)" is a public foundational course for non-English major undergraduate students, specifically designed for non-English major students who have completed College English (1) and College English (2) courses, and have passed the College English Level 4 exam (excluding students majoring in Physical Education, Music, and Fine Arts). This course focuses on basic language knowledge, basic speaking skills, learning strategies, and cross-cultural communication, guided by foreign language teaching theories, integrating various teaching models and methods into a cohesive teaching system, aiming to help students gradually develop and improve their ability to communicate orally in English through various learning and training activities. Through this course, students should be able to engage in appropriate conversations about general situations in daily life, speak coherently on general topics in social life, express their thoughts accurately, and ensure correct pronunciation, intonation, and grammar, while using language appropriately and suitably. At the same time, it helps students understand the cultural background and living customs of major English-speaking countries, enhances their cross-cultural communication skills, improves their overall cultural literacy, and strengthens their ability to learn independently, in order to meet the needs of social development and international communication in our country.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

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

**Course Objectives1：** Master basic phonetics knowledge, reading skills, and retelling techniques, possessing good reading ability and a certain level of oralretelling ability.

**Course Objectives2:**Master the vocabulary and sentence patterns required for daily conversations in a cross-cultural context, and possess the language skills necessary for general academic purposes as well as preliminary sociolinguistic and pragmatic abilities.

**Course Objectives3:**Master basic speaking skills and deliver impromptu speeches on familiar topics, able to express one's views and intentions fluently in English, and possess good oral expression abilities.

**Course Objectives4:**Master basic knowledge of Anglo-American culture and fundamental concepts of intercultural communication, understand the cultural background and customs of major English-speaking countries, and possess a certain level of intercultural communication skills, sensitivity to cultural differences, tolerance, and flexibility in handling cultural differences.

### (2) Teaching Methods

1. Classroom teaching insists on students as the main body of learning, with detailed explanations and extensive practice, focusing on the actual practice of students' language skills in the classroom. By using multimedia, supplemented with language text examples, audio materials, and video resources, language scenarios are simulated to help students engage in language comprehension and expression practice, enhancing their practical English application abilities and increasing their interest in learning English. A three-dimensional teaching model driven by language output is adopted: classroom instruction + task-based learning + information technology teaching, combining in-class and out-of-class activities, integrating online and offline, combining speaking and listening, viewing, reading, and writing.

2. Homework

Most of the homework is released throughFIFspeaking training platform，with a set deadline，a small portion is sent in the form of voice assignments viaQQ、WeChat or email.

3.Special Discussion

Arrange relevant thematic discussions based on the teaching content, especially on ideological and political education，broaden learning perspectives, and enhance the ability to analyze and solve problems，help establish a correct outlook on life、values。

Formulated by:Wen QiaopingDepartment (Office) Head Review:Wen JingCollege Leadership Review:Liu Xiangyou

# College English Extension Course (2) Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | College English Extension Course（2） | | | | | Course Number | 9054311041 | | |
| English name | College English Extension Course (2) | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required □ Elective □ ) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of HumanitiesDepartment of College English Teaching | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | College English（1）, College English（2） etc. | | | | | | | | |
| Textbooks and reference materials | Textbook: "Overview of English-speaking Countries" (Revised Edition) edited by Xie Fuzhi, Foreign Language Teaching and Research Press.<br>References:Internet culture videos、Overview of English-speaking Countries、Culture Mastery of the UK, US, and Australia3Countries、Foreign cultural experiencerelated textbooks, etc. | | | | | | | | |

**CourseIntroduction**

《College English Extension Course (2)》（College English Extension Course (2)）isanelective courseofferedtosecond-year studentsmajoring inWater Supply and Drainage Science and Engineering.With the increasing frequency of foreign exchanges and the need for international work in our country, college students not only need to master English and improve their language application skills, but also deepen their understanding of the basic social and cultural conditions of English-speaking countries, so as to better engage in cross-cultural communication in work and life. This course is designed to meet this need and is offered as an elective course according to the "Teaching Requirements for College English Courses," mainly introducing and explaining the society and culture of the UK and the US, covering geography,history,politics,economics,education,and various aspects of customs, reflecting the principle that English teaching must closely integrate language instruction with cultural knowledge, which is beneficial for the mutual promotion of language teaching and cultural knowledge teaching in the foundational stage.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study,master thegeography, history, language development, culture, society, and other aspects of the United States and the United Kingdom information, understand the United States and the United Kingdom not only from the economic and political perspectives but also from the social and cultural perspectives, and useneutral, appropriate, multi-faceted, and practical investigations to understand British and American culture.

**Course Objectives2:**To cultivate outstanding talents who can effectively apply the foundational knowledge of the English language along with a broad understanding ofBritish and Americancultural backgroundstogether, who can better engage in cross-cultural communication and interaction based on an understanding of British and American culture and the differences between Eastern and Western cultures.

**Course Objectives3:**Masterthe basic information about the geography,history,politics,economy,education,customs, etc. of English-speaking countries,possess a certain international perspective,and have the language and cultural skills required for undertaking international water supply and drainage engineering projects.

**Course Objectives4:**Be able toindependentlyanalyzeEnglish texts related to British and American culture,self-learn the English knowledge required for international projects in the drainage engineering major.Develop the habit of reading English newspapers and magazines,to understand the cutting-edge developments in the drainage engineering field in British and American countries,and learn their advanced industry technologies and management experiences.

**(2) Teaching Methods**

1. Class Instruction and SelfDirected Learning

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including thought questions, Q&A,brainstorming,essays, etc..Deepen understanding and mastery of the content taught in class, and cultivate students' ability to think independently, analyze, and solve problems.

3.Watch Cultural Experience Videos

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

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Long JuanDepartment (Office) Head Review:Wen JingCollege Leadership Review:Liu Xiangyou

# Application WritingTeaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Application writing | | | | | Course Number | 9051111050 | | |
| English name | Applied Writing | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of HumanitiesDepartment of College English Teaching | | | | | | | | |
| Total study hours | 16 | credit | 1.0 | theoretical study hours | 16 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Textbook: "Guided Writing of Applied Documents" edited by Fu Jianan and Wu Zhiling, Chengdu: University of Electronic Science and Technology Press.<br>Reference materials: National Document Standards, online videos, and related textbooks, etc | | | | | | | | |

## CourseIntroduction

Applied Writing （ Applied Writing ） is a foundational course offered in higher education institutions. This course systematically introduces and teaches the knowledge and skills of writing commonly used application documents in current social life, based on the introduction of basic theories and foundational knowledge. It is highly practical, operable, and socially applicable, effectively helping students improve their ability to apply application writing knowledge to handle daily work while mastering the corresponding professional knowledge and professional skills。

Application writing skills are one of the basic skills for students after graduation. Through this course, students can master the writing rules and techniques of application documents. This not only directly improves students' practical writing abilities to meet the needs of future work, but also promotes students' overall development and enhances their overall quality through comprehensive training in reading and writing thinking, which is beneficial for students' sustainable development.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through learning， master thebasictheories and foundational knowledge of practical writing，and be able to skillfully apply practical writing knowledge to handle daily work。

**Course Objectives2:**Proficiently write various commonly used application documents that comply with national policies and regulations, have correct viewpoints, substantial content, reasonable structure, clear levels, clear expression, appropriate language, and correct punctuation, and be able to standardly write practical reports such as experiments, internships, and professional design texts.

**Course Objectives3:**Throughcomprehensive training in reading and writing thinking,students will be able to clearly express personal views and design ideas,improve theircommunication and interaction skills,promote students' overall development andsustainable development.

**(2) Teaching Methods**

1. Emphasis on classroom teaching and selfdirected learning equally

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Writing Training

Chapter Content ArrangementSpecialized Writing,deepening understanding and mastery of the content taught in class, cultivating students'writing according to requirements,and clearly expressing personal viewpoints and design ideascommunication and exchange abilities.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Xiao YanDepartment (Office) Head Review:Wu ZhilinCollege Leadership Review:Liu Xiangyou

# Syllabus for Mental Health Education for College Students

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Mental Health Education for College Students | | | | Course Number | 9131311010 | | | |
| English name | Psychology health education for university students | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required£) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Student Affairs DepartmentArmed Forces DepartmentStudent Work Office | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 12 | practical study hours | 20 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | "Textbook on Mental Health Education for College Students" edited by the Hunan Provincial Department of Education, Hunan University Press | | | | | | | | |

## CourseIntroduction

《大学生心理健康教育》（Psychology health education for university students）is a public compulsory course that integrates knowledge impartation, psychological experience, and behavioral training. It is in accordance with the spirit and requirements of the "Opinions on Further Strengthening and Improving Mental Health Education for University 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 university students for self-growth. The course aims to help students understand the standards and significance of mental health, enhance their awareness of self-psychological care and crisis prevention, master and apply mental health knowledge, cultivate self-awareness, interpersonal communication skills, and self-regulation abilities, effectively improve psychological quality, and promote the overall development of students.

## Course teaching objectives and the supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through this course, students will understand the relevant theories and basic concepts of psychology, clarify the standards and significance of mental health, understand the psychological development characteristics and abnormal behaviors of individuals during the university stage, and master the basic knowledge of self-adjustment.

**Course Objectives2:**Through this course, students will master self-exploration skills, psychological adjustment skills, and psychological development skills, such as learning

development skills, environmental adaptation skills, stress management skills, communication skills, problem-solving skills, self-management skills, interpersonal skills, and career planning skills.

**Course Objectives3:**Through this course, students will develop an autonomous awareness of mental health development, understand their own psychological characteristics and personality traits, and be able to objectively evaluate their physical conditions, psychological states, and behavioral abilities. They will learn to correctly recognize and accept themselves, and when encountering psychological issues, be able to self-adjust or seek help, actively exploring a lifestyle that suits them and adapts to society.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2.Case Analysis andGroup Discussion

Chapter ContentArrangementCorrespondingCase Discussionsand group discussions to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Practical Experience

In conjunction with classroom teaching, organize correspondingpractical coursesto acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Prepared by:Cao ZiliDepartment (Office) Head Review:Sun FangCollege Leadership Review:Kuang Yanqun

# Syllabus for College Students' Career Development and Employment Guidance (1)

| | | | |
|---|---|---|---|
| Course Name | Career Development and Employment Guidance for College Students (1） | Course Number | 9151311010 |
| English name | Career Development and Employment Guidance for College Students（1） | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required£) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Enrollment and Employment Office | | | | | | | | |
| Total study hours | 20 | credit | 0.5 | theoretical study hours | 8 | practical study hours | 12 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Course Materials:1."Career Development and Employment Guidance for College Students," edited by Cao Min, Hunan Science and Technology Publishing House,2012published. | | | | | | | | |

## CourseIntroduction

《Career Development and Employment Guidance for College Students（1）（1）） course emphasizes the important role of careers in personal development while also focusing on the comprehensive and lifelong development of students. It mainly aims to stimulate college students' awareness of their career development, establish a correct view of employment, and encourage them to rationally plan their phased personal development by choosing suitable methods and approaches. Through activities such as certification exams, graduate school entrance exams, qualification assessments, and civil service training guidance, it helps students further clarify their developmental goals during their university studies and consciously improve their employability and career management skills—this is a public compulsory course.

## Course teaching objectives andthe supported graduation requirements

**Course teaching objectives**

Through course teaching, college students should achieve the following goals at the levels of attitude, knowledge, and skills:

**Course Objectives1：** College students should establish a sense of autonomy in their career development, cultivate a positive and correct outlook on life, values, and employment concepts, integrate personal development with national needs and social development, establish the concept and awareness of a profession, and be willing to actively contribute efforts for their personal career development and social progress.

**Course Objectives2:**Have a basic understanding of the characteristics of the stages of career development, clearly recognize one's own traits, the characteristics of professions, and the social environment through methods such as the Holland Career Interest Test, understand the employment situation and policies and regulations, and master basic knowledge of labor market information and relevant occupational classifications.

**Course Objectives3:**Basic understanding of obtaining professional qualifications related to the major, selection of graduate school majors, directions, and schools, as well as preparation, knowledge related to the English CET-4 and CET-6 exams, civil service exams, and selection of students, etc.

**(2) Teaching Methods**

1. Class Lecture

A detailed introduction to relevant theoretical knowledge.

2. Homework

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

3.Classroom Tests and Discussions

Complete the Holland Occupational Interest Test and share it with classmates.

4.Special lectures or exchange meetings

According to the college's arrangement, participate in the graduate school entrance examination exchange meeting, public service training, etc.

Formulated by: Yang GuanghuiDepartment (Office) Director Review:Tang ZhengjunCollege Leadership Review:Li Mengxing

# Syllabus for College Student Career Development and Employment Guidance (2)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Career Development and Employment Guidance for College Students (2) | | | | Course Number | | 9151311020 | | |
| English name | Career Development and Employment Guidance for College Students（2） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course □ Core Major Course (Elective □ Required£) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Enrollment and Employment Office | | | | | | | | |
| Total study hours | 18 | credit | 0.5 | theoretical study hours | 4 | practical study hours | 14 | Machine learning hours | |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Course materials: "Career Development and Employment Guidance for College Students," edited by Cao Min, Hunan Science and Technology Publishing House,2012 published. | | | | | | | | |

**CourseIntroduction**

《Career Development and Employment Guidance for College Students（2）（2） course mainly analyzes the current national employment situation and the employment status of our school in recent years, combined with relevant employment policies from various levels of government, to help students understand the employment situation and policies, master basic labor market information, guide students to develop a good job-seeking mindset

and psychological quality, lead students to fully recognize their own characteristics and potential, enhance self-confidence, and overcome feelings of inferiority; master resume writing and interview skills, self-exploration skills, information search and management skills, career decision-making skills, job-seeking skills, etc., to improve students' various general skills, including communication skills, problem-solving skills, self-management skills, and interpersonal skills, to face and participate in employment competition with a positive and healthy mindset, and obtain satisfactory employment positions.

Course teaching objectives andthe supported graduation requirements

**Course teaching objectives**

Through course teaching, college students should achieve the following goals in job interviews:

**Course Objectives1：** To have a basic understanding of the employment situation of college students nationwide in recent years, as well as the employment situation of students in this major at our university, and the relevant employment policies introduced by the government, to establish a correct view on career choice and to determine employment goals.

**Course Objectives2:**Master self-exploration skills, information search and management skills, career decision-making skills, etc., to enhance students' various general skills, including communication skills, problem-solving skills, self-management skills, and interpersonal skills.

**Course Objectives3:**Basic understanding of the channels and methods for obtaining employment information and the employment process, mastering the methods of resume writing and workplace etiquette, and achieving employment through interviews and other means.

**(2) Teaching Methods**

1. Class Lecture

A detailed introduction to relevant theoretical knowledge.

2. Discussion and Assignments

Complete a qualified resume.

3.Watch the video

Workplace etiquette and the complete interview process.

4.On-site Observation

Participate in various job fairs held at the school to understand the recruitment process.

Formulated by:Yang GuanghuiDepartment (Office) Director Review:Tang ZhengjunCollege Leadership Review:Li Mengxing

# Basic Teaching Outline for 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 | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course£ | | | | | | | | |
| Course Offering Unit | Engineering Training CenterCollege of Application and Innovation Entrepreneurship | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 8 | practical study hours | 24 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Teaching materials and resources | Course textbook: "Innovation and Entrepreneurship Course for College Students" edited by Qiu Wenwei, Xi'an Jiaotong University Press 2016<br>Reference materials: College Student Entrepreneurship Service Network, etc | | | | | | | | |

## Course Introduction

Innovation and Entrepreneurship EducationInnovation and Entrepreneurship Education is a public compulsory course offered to all first-year undergraduate students. The purpose of this course is to provide students with foundational knowledge and basic theories of innovation and entrepreneurship through educational activities, familiarize them with the basic processes and methods of innovation and entrepreneurship, understand relevant policies and laws, stimulate students' innovative spirit, entrepreneurial awareness, and capabilities, cultivate teamwork spirit, enhance students' sense of social responsibility, comprehensively improve students' overall quality, lay a foundation for students' subsequent innovation and entrepreneurship practices as well as employment and entrepreneurship, and promote the overall development of students.

## 2. Course teaching objectives and the graduation requirements they support

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** To help students understand the cutting-edge dynamics and development trends of the industry, familiarize themselves with relevant policies and laws, consciously follow the rules 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 as well as personal comprehensive

development, possess the necessary capabilities for innovation and entrepreneurship, and actively engage in innovative and entrepreneurial practices.

**Course Objectives2：** Understand the importance of entrepreneurs and teams, cultivate students' spirit of teamwork, learn the mindset for forming teams and its impact on innovation and entrepreneurship activities, recognize the role and function of leaders in innovative and entrepreneurial teams, and master the skills, strategies, and basic methods for forming and managing innovative and entrepreneurial teams.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Guo Zijia Department (Office) Director Review: Guo Zijia
College Leadership Review: Jiang Dongchu

# Syllabus for Military Theory Teaching for College Students

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Military Course Textbook for College Students | | | | | Course Number | 9132311020 | | |
| English name | College Students Military Course | | | | | | | | |
| Applicable majors | All students in the school | | | | | | | | |
| Course nature | Public compulsory courses | | | | | | | | |
| Total study hours | 36 | credit | 2 | theoretical study hours | 12 | practical study hours | 24 | Machine learning hours | 0 |
| Prerequisite | | | | | | | | | |

| | |
|---|---|
| courses | |
| Reference textbook | "Newly Compiled Military Course Textbook for Higher Education" edited by Professor Zhao Rong, National University of Defense Technology Press2017YearJune;"College Student Military Course Textbook" edited by Professor Li XiandeChief EditorBeijing Institute of TechnologyUniversity Press<br><br>2016Year7First Edition |

## 1. Course Introduction

《大学生军事理论》（College Students Military Course）is a compulsory public course for freshmen, mainly covering topics such as: China's national defense, national security, military thought, modern warfare, and information technology equipment, totaling32class hours. In addition, the promotion of national defense education work is carried out through activities such as National Defense Education Day, participating in national defense education bases, and holding national defense knowledge competitions.

## 2、Course teaching objectives andsupported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1:In the teaching process, it is advisable to use forms such as group discussions, thematic speeches, special debates, term interpretations, and image appreciation to present the opportunities and challenges facing surrounding security, China's modernization of national defense, the development of military thinkers and their ideas, advancements in military technology, comparisons of advanced weaponry between China and foreign countries, and the forms of warfare in the information age, allowing students to experience the joy of enhanced innovative capabilities through divergent and convergent thinking.

Course Objective 2:Ability to analyze problems: Based on students' mastery of the basic knowledge in each part, they are required to integrate and scientifically grasp this system. How to analyze the strategic environment as a major premise, recognize the characteristics of the current international military strategic pattern and future development trends, and identify the advantages and issues in the international and domestic environment in which our country is situated.

Course Objective 3:Responsibility and Accountability: Through focused learning, patriotic education, and the cultivation of heroism from multiple levels, angles, and elements for young people, it can effectively stimulate patriotism, a sense of duty to the country, and aspirations for national strength, enabling them to truly become the "pillars of the nation" and take on the "heavy responsibilities of the Chinese nation."

Course Objective 4:Ability to obey laws and regulations: The duty of a soldier is to obey orders and follow commands in all actions,and through the study and education of military theory courses, students are encouraged to establish discipline and cultivate this ability.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Liu HongxingDepartment (Office) Head Review: Cai YingjieCollege Leadership Review:He Zhengyi

# Syllabus for Basic Computer Education for College Students

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Basic Computer Skills for College Students | | | | Course Number | 9063311011 | | | |
| English name | College Students' Computer Foundation | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course ☐ Core Major Course (Elective ☐ Required ☐) Independent Development Course (Required ☐ Elective ☐) Intensive Practice Course ☐ | | | | | | | | |
| Course Offering Unit | School of Information and Electronic Engineering | | | | | | | | |
| Total study hours | 32 | credit | 1.5 | theoretical study hours | 16 | practical study hours | 0 | Machine learning hours | 16 |
| Prerequisite courses | None | | | | | | | | |

| | |
|---|---|
| Reference textbook | Course Materials:"College Computer," "College Computer Practical Tutorial" edited by Mo Zhao et al., Beijing University of Posts and Telecommunications Press<br>References:Basic Theory and Operation Manual of Computers, etc. |

**CourseIntroduction**

《大学生计算机基础》（College Students' Computer Foundation）is a public compulsory course, the first computer foundation course offered to non-computer major students, and a prerequisite for further study of other computer courses, designed to cultivate college students' awareness of computer culture. The course content mainly includes basic computer knowledge, basic use of operating systems, Office series office software applications, basic knowledge of computer networks and network security, Internet basic applications, and basic knowledge and applications of multimedia technology. The course content is based on basic computer operations, with a focus on the application of Office series office software in practical work.

**Course teaching objectives andthe supported graduation requirements**

**1Course Teaching Objectives**

The overall goal of this course is: students will be able to master the basic knowledge and fundamentals of computers through studying this course

Ability to skillfully applyOfficeseries office software, and initially possess the ability to use computers to analyze and solve problems, laying the foundation for further study of other computer courses and for applying computer knowledge and skills to solve practical problems in this field in the future.

**Course Objectives1：** Familiarize with the basic components of microcomputer systems and the functions of each component, as well as the typical application areas of computers.

**Course Objectives2**: Familiarize yourself with the basic functions of computer operating systems and master the basic use ofWindowsoperating system.

**Course Objectives3:**Master the application of commonly used office software such as word processing software, spreadsheet software, and presentation software, be familiar with the basic knowledge of computer networks and network security, and master the basic applications of the Internet (Internet).

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Xi ShengfengDepartment (Office) Director Review:He QianCollege Leadership Review:Tan Weishi

# Syllabus for Computer Language (C Language) Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Computer Language (C Language) | | | | Course Number | 9063311021 | | | |
| English name | C Language Programming | | | | | | | | |
| Applicable majors | All non-computer science majors in the school and those in science and engineering fields | | | | | | | | |
| Course nature | General Education CourseRDisciplinary Foundation Course£Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Information and Electronic Engineering | | | | | | | | |
| Total study hours | 64 | credit | 3.0 | theoretical study hours | 32 | practical study hours | 32 | Machine learning hours | 0 |
| Prerequisite courses | Introduction to Computational ThinkingB | | | | | | | | |
| Textbooks and reference materials | Course Textbook:CProgramming(Fourth Edition), edited by Tan Haoqiang, Tsinghua University Press<br>References:Cprogramdesign manuals, specifications, related textbooks, etc. | | | | | | | | |

## CourseIntroduction

This course is aimed at undergraduate students (in science and engineering) from non-computer majors in the entire college and is a required general education course in the teaching plan. This course serves as an introductory course for students to learn programming and software development. The computer programming language (C language) is an efficient and practical procedural programming language, and it is a very important foundational course for undergraduate students (in science and engineering) from non-computer majors. As an introductory course to learning high-level languages, this course aims to cultivate students' programming thinking. Through the study of the C programming course, students will develop basic abstract thinking in program design (process-oriented programming thinking), master the basic syntax knowledge of high-level languages and the basic steps of debugging programs, initially grasp the "top-down, step-by-step refinement" programming design method and the basic norms of program design, and understand the characteristics of the C

language and its related knowledge in computing, laying a foundation for further study of other computer courses. Through this learning, students will not only master the knowledge of high-level programming languages, programming techniques, and basic algorithms but also grasp the ideas and methods of program design, enhancing their ability to use computers to solve practical problems and flexibly apply high-level languages for program design. Therefore, this course is one that is both theoretical and practical.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Master the basic methods of program design and the basic steps of debugging programs;

**Course Objectives2：** Master the definition rules of functions and simple calls;

**Course Objectives3:**Master the basic methods of simple program design using sequential structures, selection structures, and loop structures, master classic algorithms and be able to design some commonly used simple algorithms;

**Course Objectives4:**Master the use of one-dimensional and two-dimensional arrays;

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Xi ShengfengDepartment (Office) Director Review:He QianCollege Leadership Review:Tan Weishi

# University Physical Educationand HealthCourse (1) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University Sportsand Health（1） | | | | Course Number | 9103811010 | | | |
| English name | College physical education | | | | | | | | |
| Applicable majors | Non-sports major | | | | | | | | |
| Course nature | General Education CourseDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Sports College | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 20 | practical study hours | 12 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | "University PhysicalEducation and Health Education" Ethnic Publishing House, edited by Professor Bai Jinxiang,<br>"University Sports Theory and Practice Tutorial" Ethnic Publishing House, edited by Professor Bai Jinxiang | | | | | | | | |

## CourseIntroduction

Physical education courses are compulsory public courses for college students that primarily use physical exercise as a means to achieve the main goals of enhancing physical fitness, improving health, and increasing sports literacy through reasonable physical education and scientific exercise processes; they are an important component of the school curriculum system; they are the central link in the physical education work of higher education institutions; and they are an essential way to implement quality education and cultivate well-rounded talents.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1**: Sports Participation Goals: Actively participate in various sports activities and basically develop the habit of conscious exercise, fundamentally forming a lifelongawareness of physical exercise, able to formulate feasible personal exercise plans, and possess a certain level ofappreciation for sports culture.

**Course Objectives2:**Sports SkillsObjective: To master the basic methods and skills of more than two fitness exercises proficiently, and to conductphysical training scientifically, improve one's athletic ability, and master the commonsports injuries treatment methods.

**Course Objectives3:**Health Goals: To be able to test and evaluate physical health status, master effective methods to improvephysical fitness, knowledge and methods for comprehensive physical development; to develop good behavioral habits, form a healthy social approach; and to have a healthy physique.

**Course Objectives4：** Mental Health Objectives: Set sports goals according to one's own abilitiesLearning Objectives；Be able to consciously improve mental state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; use appropriate methods to regulate one's emotions; experience the joy of sports and the feeling of success in exercise.

**Course Objectives5:**Social AdaptationObjective: Demonstrate good sportsmanship and a spirit of cooperation, and correctly handle the relationship between competition and cooperation.

**(2) Teaching Methods**

1. On-siteteaching andtrainingare equally important

Cooperateon-siteteaching, organize corresponding on-sitetraining.

Formulated by:Zhang Xufeng/Li LeDepartment (Office) Head Review:Ou YueshanCollege Leadership Review:Guo Yu

# University Physical Educationand HealthCourse (2) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University Sportsand Health（2） | | | | Course Number | 9103811020 | | | |
| English name | College physical education | | | | | | | | |
| Applicable majors | Non-sports major | | | | | | | | |
| Course nature | General Education CourseDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Sports College | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 20 | practical study hours | 12 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | "University PhysicalEducation and Health Education" Ethnic Publishing House, edited by Professor Bai Jinxiang,<br>"University Sports Theory and Practice Tutorial" Ethnic Publishing House, edited by Professor Bai Jinxiang | | | | | | | | |

CourseIntroduction

Physical education courses are compulsory public courses for college students that primarily use physical exercise as a means to achieve the main goals of enhancing physical

fitness, improving health, and increasing sports literacy through reasonable physical education and scientific exercise processes; they are an important component of the school curriculum system; they are the central link in the physical education work of higher education institutions; and they are an essential way to implement quality education and cultivate well-rounded talents.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1**: Sports Participation Goals: Actively participate in various sports activities and basically develop the habit of conscious exercise, fundamentally forming a lifelongawareness of physical exercise, able to formulate feasible personal exercise plans, and possess a certain level ofappreciation for sports culture.

**Course Objectives2:**Sports SkillsObjective: To master the basic methods and skills of more than two fitness exercises proficiently, and to conductphysical training scientifically, improve one's athletic ability, and master the commonsports injuries treatment methods.

**Course Objectives3:**Health Goals: To be able to test and evaluate physical health status, master effective methods to improvephysical fitness, knowledge and methods for comprehensive physical development; to develop good behavioral habits, form a healthy social approach; and to have a healthy physique.

**Course Objectives4：** Mental Health Objectives: Set sports goals according to one's own abilitiesLearning Objectives；Be able to consciously improve mental state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; use appropriate methods to regulate one's emotions; experience the joy of sports and the feeling of success in exercise.

**Course Objectives5:**Social AdaptationObjective: Demonstrate good sportsmanship and a spirit of cooperation, and correctly handle the relationship between competition and cooperation.

**(2) Teaching Methods**

1. On-siteteaching andtrainingare equally important

Cooperateon-siteteaching, organize corresponding on-sitetraining.

Formulated by:Zhang Xufeng/Li LeDepartment (Office) Head Review:Ou YueshanCollege Leadership Review:Guo Yu

# University Physical Educationand HealthCourse (3) Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University Sportsand Health（3） | | | | Course Number | 9103811030 | | | |
| English name | College physical education | | | | | | | | |
| Applicable majors | Non-sports major | | | | | | | | |
| Course nature | General Education CourseDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Sports College | | | | | | | | |
| Total study hours | 20 | credit | 0.5 | theoretical study hours | 20 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | "University PhysicalEducation and Health Education" Ethnic Publishing House, edited by Professor Bai Jinxiang,<br>"University Sports Theory and Practice Tutorial" Ethnic Publishing House, edited by Professor Bai Jinxiang | | | | | | | | |

## CourseIntroduction

Physical education courses are compulsory public courses for college students that primarily use physical exercise as a means to achieve the main goals of enhancing physical fitness, improving health, and increasing sports literacy through reasonable physical education and scientific exercise processes; they are an important component of the school curriculum system; they are the central link in the physical education work of higher education institutions; and they are an essential way to implement quality education and cultivate well-rounded talents.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1**: Sports Participation Goals: Actively participate in various sports activities and basically develop the habit of conscious exercise, fundamentally forming a lifelongawareness of physical exercise, able to formulate feasible personal exercise plans, and possess a certain level ofappreciation for sports culture.

**Course Objectives2:**Sports SkillsObjective: To master the basic methods and skills of more than two fitness exercises proficiently, and to conductphysical training scientifically, improve one's athletic ability, and master the commonsports injuries treatment methods.

**Course Objectives3:**Health Goals: To be able to test and evaluate physical health status, master effective methods to improvephysical fitness, knowledge and methods for

comprehensive physical development; to develop good behavioral habits, form a healthy social approach; and to have a healthy physique.

**Course Objectives4：** Mental Health Objectives: Set sports goals according to one's own abilitiesLearning Objectives; Be able to consciously improve mental state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; use appropriate methods to regulate one's emotions; experience the joy of sports and the feeling of success in exercise.

**Course Objectives5:**Social AdaptationObjective: Demonstrate good sportsmanship and a spirit of cooperation, and correctly handle the relationship between competition and cooperation.

**(2) Teaching Methods**

1. On-siteteaching andtrainingare equally important

Cooperateon-siteteaching, organize corresponding on-sitetraining.

Formulated by:Zhang Xufeng/Li LeDepartment (Office) Head Review:Ou YueshanCollege Leadership Review:Guo Yu

# University Physical Educationand HealthCourse (4) Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University Sportsand Health（4） | | | | Course Number | 9103811040 | | | |
| English name | College physical education | | | | | | | | |
| Applicable majors | Non-sports major | | | | | | | | |
| Course nature | General Education CourseDisciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Sports College | | | | | | | | |
| Total study hours | 20 | credit | 0.5 | theoretical study hours | 20 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | "University PhysicalEducation and Health Education" Ethnic Publishing House, edited by Professor Bai Jinxiang,<br>"University Sports Theory and Practice Tutorial" Ethnic Publishing House, edited by Professor Bai Jinxiang | | | | | | | | |

CourseIntroduction

Physical education courses are compulsory public courses for college students that primarily use physical exercise as a means to achieve the main goals of enhancing physical fitness, improving health, and increasing sports literacy through reasonable physical education and scientific exercise processes; they are an important component of the school curriculum system; they are the central link in the physical education work of higher education institutions; and they are an essential way to implement quality education and cultivate well-rounded talents.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1**: Sports Participation Goals: Actively participate in various sports activities and basically develop the habit of conscious exercise, fundamentally forming a lifelongawareness of physical exercise, able to formulate feasible personal exercise plans, and possess a certain level ofappreciation for sports culture.

**Course Objectives2:**Sports SkillsObjective: To master the basic methods and skills of more than two fitness exercises proficiently, and to conductphysical training scientifically, improve one's athletic ability, and master the commonsports injuries treatment methods.

**Course Objectives3:**Health Goals: To be able to test and evaluate physical health status, master effective methods to improvephysical fitness, knowledge and methods for comprehensive physical development; to develop good behavioral habits, form a healthy social approach; and to have a healthy physique.

**Course Objectives4：** Mental Health Objectives: Set sports goals according to one's own abilitiesLearning Objectives；Be able to consciously improve mental state through physical activities, overcome psychological barriers, and develop a positive and optimistic attitude towards life; use appropriate methods to regulate one's emotions; experience the joy of sports and the feeling of success in exercise.

**Course Objectives5:**Social AdaptationObjective: Demonstrate good sportsmanship and a spirit of cooperation, and correctly handle the relationship between competition and cooperation.

**(2) Teaching Methods**

1. On-siteteaching andtrainingare equally important

Cooperateon-siteteaching, organize corresponding on-sitetraining.

Formulated by:Zhang Xufeng/Li LeDepartment (Office) Head Review:Ou YueshanCollege Leadership Review:Guo Yu

# Syllabus for Advanced Mathematics A (1)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Advanced MathematicsA（1） | | | | Course Number | | 9092112011 | | |
| English name | Higher Mathematics A(1) | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective □ Compulsory£) Independent Development Course (Compulsory£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | Schoolof Philosophy | | | | | | | | |
| Total study hours | 72 | credit | 4.5 | theoretical study hours | 72 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Middle School Mathematics | | | | | | | | |
| Textbooks and reference materials | Course textbook: Song Yingqing et al.. Advanced Mathematics (Volume 1)[M]. Changsha: Hunan Science and Technology Publishing House,2018.<br>Reference: Huang Lihong, editor, Advanced Mathematics (Volume 1)[M].Beijing: Peking University Press,2018. | | | | | | | | |

## CourseIntroduction

The course "Advanced Mathematics" is an important compulsory course, degree course, and entrance examination course for graduate students in various majors at higher education institutions. It serves to cultivate high-quality specialized talents needed for the modernization of socialism in our country. The purpose of this course is to enable students to acquire basic concepts, fundamental theories, and essential computational skills in areas such as single-variable calculus, multivariable calculus, spatial analytic geometry and vector algebra, infinite series (including Fourier series), and ordinary differential equations, laying a necessary mathematical foundation for subsequent courses and further studies in other subjects.

## Course teaching objectives andthe supported graduation requirements

### Course teaching objectives

Through the theoretical teaching of this course and students' independent learning, students will acquire basic knowledge and skills. The specific course objectives are as follows:

Through students reading books and teachers' instruction, students' understanding of the limits of sequences and functions is transformed from abstract qualitative understanding to concrete quantitative analysis; mastering the related concepts and properties of infinitesimals and infinite quantities, being able to skillfully apply the operational rules of limits to calculate the limits of sequences and functions, and cleverly applying equivalent infinitesimals and two important limits; being able to prove the existence of limits of sequences and functions by utilizing their properties; mastering the concept and properties of function continuity based on the understanding of function limit theory.

Through teaching, students understandthe concepts and properties of derivatives and differentials, can use the definitions and properties of derivatives to derive the differentiation formulas and rules for basic elementary functions; can proficiently calculate the first and second derivatives of general inverse functions, composite functions, and functions represented by parametric equations, and if necessary, can calculate higher-order derivatives;master the application of derivatives and differentials in approximate calculations, and can apply them well in professional practice, for the curvature of curves, related rates of change, and solving economic problems, requiring students to fully understand the intrinsic meaning based on the foundational knowledge, basic concepts, and basic formulas of derivatives, and to apply them fully in engineering practice.

Through learning, students can flexibly apply the conditions and conclusions of several major differential mean value theorems (Rolle's theorem, Lagrange's theorem, Cauchy's theorem, and Taylor's theorem) to solve related problems (monotonicity of functions, limits of indeterminate forms, extreme and maximum values of functions, concavity and inflection points of functions, and asymptotes of curves).

Through the study of derivative knowledge and understanding of inverse operations, students grasp the concepts of the original function and indefinite integrals, master the substitution method, integration by parts, and methods for finding indefinite integrals of some special functions, laying the foundation for the calculation of definite integrals in the next chapter.

By presenting and solving 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; grasp the idea of the infinitesimal method, fully demonstrating the applications of definite integrals in geometry and physics; understand the concept and determination of improper integrals; and have a brief understanding of the approximate calculation of definite integrals for future use.

The solution of ordinary differential equations is mainly through the study of single-variable calculus, mastering the solution methods for first-order differential equations, reducible differential equations, and second-order linear differential equations based on an understanding of the basic concepts of differential equations; understanding the application of differential equations in real life through examples, thus being able to flexibly apply differential theory in practice.

**(2)Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

Through self-directed learning, cooperative learning, inquiry-based learning, discovery learning, group learning, and interactive learning, cultivate students' ability to apply the knowledge they have learned, their innovative spirit, and practical skills, allowing students to develop a positive learning attitude and a healthy, upward life attitude.

Teaching methods and teaching philosophy: Learn mathematics through solving practical problems, while also learning methods to solve practical problems in the process of learning mathematical knowledge.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhancestudents'ability to analyze and solve problems.

Prepared by:Sun HuiDepartment (Office) Head Review:Guo BingyangCollege Leadership Review:Zhou Shuangshuang

# Syllabus for Advanced Mathematics A (2)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Advanced MathematicsA（2） | | | | Course Number | 9092112021 | | | |
| English name | Higher Mathematics（2） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective□Required□) Independent Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | Schoolof Philosophy | | | | | | | | |
| Total study hours | 80 | credit | 5.0 | theoretical study hours | 80 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | "Advanced Mathematics" (Volume 1) | | | | | | | | |
| Textbooks and reference materials | Course materials: Zhou Shuangshuang et al.. Advanced Mathematics (Volume II)[M]. Changsha: Hunan Science and Technology Publishing House,2020.<br>Reference: Edited by Huang LihongAdvanced Mathematics (Volume II)[M].Beijing: Peking University Press,2018. | | | | | | | | |

## CourseIntroduction

Higher Mathematicsis an important public foundational theory course for various majors in higher engineering colleges. The research object is functions (the dependency relationship of quantities in the process of change). The main content includes functions, limits, continuity, differential calculus of single-variable functions, integral calculus of single-variable functions, vector algebra and spatial analytic geometry, differential calculus of multivariable functions, integral calculus of multivariable functions, 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, while also developing students' proficiency in calculations and their ability to analyze and solve problems using the knowledge they have learned; enabling students to master the basic concepts, basic theories, and basic calculation skills of calculus, laying a necessary mathematical foundation for further study of subsequent courses and further improvement.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study, masterthe fundamental knowledge and basic skills of advanced mathematics, understandthe relationship between advanced mathematics andthe major of water supply and drainage science and engineering, understandthe knowledge framework of advanced mathematicsand be able to apply it to solve complex engineering problems.

**Course Objectives2:**Through the course studyto master 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 for complex engineering problems.

**Course Objectives3:**Through the course studymasterthe mathematical calculation and data processing abilities required for planning, design, construction, operation, and management in the field of water supply and drainage science and engineering, possessing strong industry competitiveness in the construction of new urbanization and regional economic development.

**Course Objectives4:**Through the course studyto be able to solve complex engineering problems in water supply and drainage science and engineering, and possess strong abilities in professional collaboration, technical collaboration, and teamwork.

**Course Objectives5:**Through the course studyto have a certain international perspective and sustainable development concept, to be able to judge the development trends in the field of engagement, and to possess the ability for continuous learning and adapting to development needs.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercisesand Module Testing

Each chaptersectionarranges corresponding exercises,conducting 2-3 tests based on the teaching knowledge structure and modules. The test questions and exercisesinclude discussion questions, Q&A questions, and calculation problems, deepening understanding and mastery of the content taught in class, and cultivating students' ability to think independently, analyze, and solve problems.

3. DiscussionGuidance

According to the teaching content and class schedulethe application of advanced mathematics in water supply and drainage science and engineeringthematic discussions to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Cai XiaDepartment (Office) Head Review:Guo BingyangCollege Leadership Review:Zhou Shuangshuang

# Syllabus for Linear Algebra Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Linear Algebra | | | | | Course Number | 9092112051 | | |
| English name | Linear Algebra | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of ScienceSchool of Teacher Education | | | | | | | | |
| Total study hours | 40 | credit | 2.5 | theoretical study hours | 40 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics | | | | | | | | |
| Textbooks and reference materials | Course textbook: Li Junfeng et al.. Linear Algebra[M]. Changsha: Hunan Science and Technology Publishing House,2019. | | | | | | | | |

| | |
|---|---|
| | Reference: Huazhong University of Science and Technology, Department of Mathematics. Linear Algebra[M]. Beijing: Higher Education Press,2008.<br><br>Zhou Yong. Linear Algebra[M]. Beijing: Peking University Press, 2018.<br><br>Liu Xianzhong. Linear Algebra (Second Edition)[M]. Beijing: Higher Education Press,2003.<br><br>Mao Gangyuan. Summary of Techniques for Solving Linear Algebra Problems[M]. Wuhan: Huazhong University of Science and Technology Press, 2015. |

## Course Introduction

"Linear Algebra" is an important public foundational theory course for various majors in higher engineering institutions. With the development of modern science and technology, especially computer science, solving large systems of linear equations and calculating the eigenvalues and eigenvectors of matrices have become common problems in the field of engineering technology. Therefore, learning and mastering the theories and methods of linear algebra is an essential foundation and means for grasping modern science and technology and engaging in scientific research. It is also a necessary prerequisite for achieving the training objectives of various engineering majors at our school. Thus, the role and status of the course in linear algebra are even more significant. The main task of this course is to learn the matrix methods commonly used in science and technology, linear equations, and their related basic computational methods. This will enable students to have proficient matrix operation skills and the ability to solve practical problems using matrix methods, thereby laying a necessary mathematical foundation for further study in subsequent courses and for further improvement.

## Course teaching objectives and the supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire basic knowledge and skills. The specific course objectives are as follows:

Through learning, studentsmaster the relevant concepts and properties of determinants, can proficiently use the properties of determinants to calculate determinants, and can apply the triangular method and the reduction method, the two basic methods for calculating determinants; understand algebraic cofactors and Cramer's rule; cultivate students' ability to calculate and deduce determinants.

Through learning, students will understandthe concept of matrices,master various operations of matrices,especially the mixed operations of square matrices and determinants; master the criteria for matrix invertibility and the methods for finding inverse matrices, 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 with elementary matrix transformations, and be able to proficiently determine the rank of a matrix. Cultivate students' ability to calculate and deduce matrices, and their ability to use the basic principles of matrices to identify complex engineering problems in civil engineering.

Through learning, students will master the criteria for the solvability of linear equations and the elimination method; understand the criteria for the linear dependence of vector groups, and be able to proficiently determine the rank of vector groups and the maximum linearly independent set; grasp the conditions for non-zero solutions of homogeneous linear equations and the structure of solutions, as well as the conditions for solvability and the structure of solutions for non-homogeneous linear equations, and be able to proficiently use elementary transformation methods to find solutions and fundamental solution sets for linear equations.

Cultivate students' ability to use the knowledge of linear equationsto model and solve complex engineering problems in civil engineering.

Through teaching, help students understand concepts and properties such as eigenvalues and eigenvectors of matrices, similar matrices, and quadratic forms, as well as the necessary and sufficient conditions for a matrix to be similar to a diagonal matrix. Cultivate students' ability to compute and deduce matrix diagonalization.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly based on classroom teaching, combined with online learning, while arranging after-class discussions and Q&A.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Director of the Dai Anding System (Office) Review:Guo BingyangCollege Leadership Review:Zhou Shuangshuang

# Syllabus for 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 | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective □ Compulsory£) Independent Development Course (Compulsory£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | Schoolof Philosophy | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 32 | practical study hours | 0 | Machine learning hours | 0 |

| | |
|---|---|
| Prerequisite courses | Advanced Mathematics, Linear Algebraetc. |
| Textbooks and reference materials | Textbook: "Probability Theory and Mathematical Statistics" edited by Jin Fang et al., Hunan Science and Technology Press.<br>References: Probability Theory and Mathematical Statistics[M]. Edited by Huang Xin et al. Beijing: China Railway Publishing House, 2016. |

## CourseIntroduction

《概率论与数理统计》（Probability and Mathematical Statistics）is a branch of mathematics that specifically studies random phenomena and their quantitative laws, serving as a powerful tool for solving and addressing numerous problems related to random phenomena in the field of engineering.

Probability theory first transforms random phenomena into individual mathematical models, and then analyzes each mathematical model

The nature, characteristics, and laws of random phenomena are studied, and finally, the corresponding probability of the occurrence of random phenomena is given, reflecting the idea of mathematical modeling;

Mathematical statistics is based on the collection of relevant data on random phenomena, using probability

The theory of the argument analyzes and studies the collected data, ultimately summarizing and inferring the regularity of the corresponding random phenomena.

The statistical regularity of random phenomena is explored, and these regularities are utilized to serve humanity, which is the essence of probability and statistics

Task.

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

## Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through learning, students will master the basic concepts of probability theory, be able to skillfully apply the relationships and operations of random events, and solve classical probability and geometric probability problems; understandthe definition of conditional probability, the concept of independence of random events, and master the methods of probability calculation using the law of total probability and Bayes' theorem, as well as event independence.

**Course Objectives2：** Through learning, students will understand the definitions, properties, and calculations of one-dimensional random variables and their distribution functions; become proficient in the distribution laws of one-dimensional discrete random

variables and the definitions, properties, and related probability problems of one-dimensional continuous random variable density functions; understand the relationship between distribution laws or density functions and distribution functions; master the probability models of common distributions and the solutions to related probability problems; and master the distribution laws of functions of one-dimensional discrete random variables and the density functions of functions of one-dimensional continuous random variables.

**Course Objectives3 :** Through learning, students will understand the definitions and properties of two-dimensional random variables and their joint distribution functions, joint distribution laws, and joint density functions; master the relationship between marginal distributions (marginal distribution functions, marginal distribution laws, marginal density functions) and joint distributions (joint distribution functions, joint distribution laws, joint density functions); be proficient in solving the probabilities of related events; master the definitions of conditional distribution laws, conditional density functions, and conditional distribution functions, as well as their relationships with joint distributions and marginal distributions; remember the density function of two-dimensional uniform distribution and understand the density function of two-dimensional normal distribution; master the properties of two-dimensional normal distribution and understand its important conclusions; understand the concept of independence of random variables, and master its 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 sums, quotients, maximums, and minimums of independent random variables.

**Course Objectives4:**Through learning, students will understand the definitions of mathematical expectation, variance, covariance, and correlation coefficient for discrete and continuous random variables; become familiar with the properties of mathematical expectation, variance, covariance, and correlation coefficient; master the calculations of mathematical expectation and variance; remember the mathematical expectations and variances of common distributions and be able to solve related problems; and understand the definition of moments.

**Course Objectives5:**Through learning, students will understand the main content and ideas of mathematical statistics; comprehend the basic concepts of mathematical statistics; master the calculation methods and related properties of commonly used statistics; grasp the definitions and properties of the three major sampling distributions, and be able to use the normal distribution and the three major sampling distributions to determine the distribution of commonly used statistics for a single normal population, as well as look up tables to solve related probability problems.

**Course Objectives6:**Through teaching, students will understand the concept of point estimation, master two methods for obtaining point estimates: method of moments and maximum likelihood estimation; understand the definitions of the three evaluation criteria for point estimation: unbiasedness, efficiency, and consistency; comprehend the concepts and significance of parameter interval estimation, confidence level, and confidence interval, and master the method and conclusions for calculating the confidence interval of a single normal population parameter.

**Course Objectives7:**Through teaching, students will understand the concepts of null hypothesis and alternative hypothesis; comprehend the basic idea of significance level testing; master the basic steps of hypothesis testing and the two types of errors that may occur.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. After-class exercises

Each chapter includes corresponding exercises, including Q&A questions、calculation problems、thought questions、and advanced questions, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Cheng HongyanDepartment (Office) Head Review:Guo BingyangCollege Leadership Review:Zhou Shuangshuang

# University Physics (1) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | University Physics (1) | | | | | Course Number | 9065112011 | | |
| English name | College Physics (1) | | | | | | | | |
| Applicable majors | Engineeringmajors | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Information and Electronic Engineering (Department of Physics and Optoelectronic Engineering) | | | | | | | | |
| Total Study Hours | 48 | credit | 3.0 | theoretical study hours | 48 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics | | | | | | | | |
| Teaching materials | Course textbook: Yao Yingbo. University Physics [M]. Harbin: Harbin Institute of Technology Press, 2018. | | | | | | | | |

| | |
|---|---|
| and resources | Reference: http://www.icourses.cn/sCourse/course_2182.html<br>http://v.dxsbb.com/ligong/305/ |

## 1. Course Introduction

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

Through the study of this course, students will have a relatively comprehensive and systematic understanding of the basic concepts, principles, and laws of physics, understand the connections between various forms of motion, and have a general understanding of the modern development and new achievements in physics; students will receive preliminary and rigorous training in scientific experimental skills, computational abilities, and abstract thinking; students will become familiar with the basic ideas and methods of physics, cultivating their ability to analyze and solve problems; students will correctly understand physical concepts and laws, accurately recognize the establishment and development process of basic physical theories, and cultivate correct thinking methods and research methods, highlighting the role of this course in fostering students' dialectical materialist worldview. At the same time, students will develop a high level of scientific literacy and lay a necessary physical foundation for learning specialized knowledge and modern science and technology.

## 2.Course Teaching Objectives andSupported Graduation Requirements

### 1. Course Teaching Objectives

Through the teaching of this course, students will master basic knowledge and have a certain level of application ability. The specific objectives of the course are as follows:

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

Understand the physical meaning of tangential and normal acceleration; understand the significance of the equations of motion, and have a preliminary grasp of how to derive displacement, velocity, and acceleration from the equations of motion, as well as how to obtain the equations of motion from known velocity and acceleration;

Master Newton's three laws and their applicable conditions, and be able to correctly apply them to solve particle motion problems; master the

method of isolation and skillfully use Newton's laws to solve related mechanics problems;

Understand the definition of work, master the method of calculating variable force work, understand the characteristics of conservative force work and the concept of potential energy; understand and be able to apply the work-energy theorem, master the content and applicable conditions of the law of conservation of mechanical energy, and be able to use it to solve related mechanics problems; understand the concepts of momentum and impulse, understand the principle of momentum, master the content and applicable conditions of the law of conservation of momentum, and be able to use it to solve related collision problems;

Master the rigid body, the translational and rotational motion of rigid bodies, the fixed-axis rotation of rigid bodies, the angular momentum of rigid bodies, rotational kinetic energy, moment of inertia, torque, rotational laws, work of torque, the theorem of rotational kinetic energy, the angular momentum theorem of rigid bodies, and the law of conservation of angular momentum

Master the concept of simple harmonic motion, the equation of simple harmonic motion, amplitude, period, frequency, angular frequency, phase, and the rotating vector method; understand the energy and characteristics of simple harmonic motion; master the synthesis of simple harmonic motion: synthesis of harmonic motions with the same direction and frequency, synthesis of harmonic motions with the same direction but different frequencies; understand damped vibrations, forced vibrations, and resonance;

Master the generation and propagation of mechanical waves in elastic media, longitudinal waves and transverse waves, wave speed, frequency, wavelength, and their relationships; master the wave equation of plane harmonic waves; master the energy, energy flow, and energy flow density of mechanical waves;

Master the Huygens principle, the principle of superposition of waves, diffraction, the principle of wave superposition, phase difference, wave interference, standing waves; understand the Doppler effect;

Understand the basic concepts of gas molecular motion theory, the state parameters of gases, equilibrium states, and equilibrium processes; master the ideal gas state equation, the pressure formula of ideal gases, and the temperature formula and their statistical significance; master the energy equipartition theorem, the internal energy of ideal gases; master Maxwell's velocity distribution, average velocity, root mean square velocity, and most probable velocity; master the average collision frequency and mean free path of gases; understand the internal energy, work, and heat of the system;

Master the first law of thermodynamics and its application to the four quasi-static processes of ideal gases: isochoric, isobaric, isothermal, and adiabatic, as well as the molar heat capacity of gases; understand the cyclic process, Carnot cycle, Carnottheorem, and thermal efficiency; understand the physical significance of the second law of thermodynamics, reversible and irreversible processes, the statistical significance of the second law of thermodynamics, and entropy;

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Wan Zhuo Department (Office) Head Review: Zhang Saiwen College Leadership Review: Tan Weishi

# University Physics (2)Teaching Syllabus

| | | | |
|---|---|---|---|
| Course Name | University Physics (2) | Course Number | 9065112021 |
| English name | College Physics (2) | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education Course£Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£ ) Concentrated Practice Course□ | | |
| Course Offering | School of Municipal and Surveying Engineering | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Unit | | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 48 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics | | | | | | | | |
| Textbooks and reference materials | Textbook: "University Physics" (First Edition) edited by Yao Yingbo, Harbin Institute of Technology Press.<br>References: Cheng Shouzhu "General Physics" et al. | | | | | | | | |

## 1. Course Introduction

College Physics (2)(College Physics (2) is the science that studies the most common and fundamental forms of motion and their laws in the material world. It is the foundation of many natural sciences and engineering technologies. For higher engineering majors, "College Physics" is an important required foundational course, closely related to many basic courses and technical foundational courses.

Through the study of this course, students will have a relatively comprehensive and systematic understanding of the basic concepts, principles, and laws of physics, understand the connections between various forms of motion, and have a general understanding of the modern development and new achievements in physics; students will receive preliminary and rigorous training in scientific experimental skills, computational skills, and abstract thinking abilities; students will become familiar with the basic ideas and methods of physics, and cultivate their ability to analyze and solve problems; the course will also play a role in cultivating students' dialectical materialist worldview. At the same time, it will cultivate students with a high level of scientific quality and lay a necessary physical foundation for students to learn professional knowledge and modern science and technology. Course teaching objectives and supported graduation requirements.

## 2. Course teaching objectives and the graduation requirements they support

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the study of this course, students should understand the meanings of basic physical quantities related to electric fields, magnetic fields, and electromagnetic induction; understand and master basic theorems, laws, and fundamental analytical methods; understand and master Gauss's theorem and Ampère's circuital law and their applications.

**Course Objectives2 ：** Through the study of this course,understand the monochromaticity and coherence of light sources and acquire two methods for obtaining coherent light,be able to quantitatively calculate, analyze, and determine the positions of interference fringes in Young's double-slit interference, thin film interference, wedge interference, and Newton's rings, master Malus's law and Brewster's law,understand the half-wave plate method; master the calculation of single-slit Fraunhofer diffraction and the positions of dark fringes; analyze the effects of slit width and wavelength on diffraction patterns,master the grating formula; determine the positions of grating diffraction spectral

lines and the order of diffraction; analyze the effects of grating constant and wavelength on the distribution of grating diffraction spectral lines,understand the Rayleigh criterion; understand the impact of light diffraction on the resolving power of optical instruments

**Course Objectives3**: By integrating the connections between physics and the field of water supply and drainage science and engineering, as well as the needs of scientific research and production in teaching, guide students to learn knowledge more authentically, understand principles, master laws, and enhance their engineering practice and innovation abilities.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Xu ZhifengDepartment (Office) Head Review:Zhang SaiwenCollege Leadership Review:Tan Weishi

# Syllabus for University Physics Laboratory Teaching

| | | | |
|---|---|---|---|
| Course Name | University Physics Experiment | Course Number | 9065212030 |
| English name | Physical Experimentation | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective □ Required£) Independent Development Course (Required£Elective £) Concentrated Practice Course □ | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Offering Unit | School of Information and Electronic Engineering | | | | | | | | |
| Total Study Hours | 16 | credit | 0.5 | theoretical study hours | 0 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | University Physics | | | | | | | | |
| Textbooks and reference materials | "University Physics Experiments" Xu Zhifeng Beijing University of Posts and Telecommunications Press | | | | | | | | |

## 1. Course Introduction

"University Physics Experiment" is an independent required course for college students that provides basic training in scientific experiments. It plays an irreplaceable role in cultivating students' practical abilities and knowledge compared to other courses. The purpose is to deepen students' understanding of the basic principles of university physics and to cultivate their initial ability to design and organize physics experiment plans. It aims to develop students' general skills in conducting experiments and their basic ability to use experimental instruments and equipment; to cultivate students' basic ability to analyze and process experimental data. It lays a necessary foundation for students' lifelong learning and continued development. This course is one of the six key courses established by the former Ministry of Education.

## 2. Course teaching objectives and the graduation requirements they support

1. Course Teaching Objectives

Through the teaching and training of this course, students will acquire the following abilities:

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

Course Objective 2:Enable students to correctly use common instruments with the help of textbooks or instrument manuals.

Course Objective 3:Enable students to qualitatively and quantitatively assess the accuracy of results and study physical laws using physical theories.

(2) Teaching Methods

To enable students to learn the knowledge and methods of physics experiments based on their middle school physics experiments, following the principle of gradual progression, and to receive training in experimental skills, thereby gaining a preliminary understanding of the main processes

and basic methods of conducting experiments, laying a solid foundation for further study in the future.

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

2. Cultivate students' scientific experiment skills:

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

By reading the relevant instrument documentation, one can correctly use common instruments.

(3) Accurately record and process experimental data, and draft a qualified experimental report.

(4) Cultivate students' scientific writing skills and language expression abilities by drafting experimental reports.

3. Cultivate students' rigorous academic attitude and pragmatic scientific style.

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

# Syllabus for Engineering Drawing Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Engineering drawing | | | | | Course Number | | 9112112111 | |
| English name | Engineering Drawing | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ） Independent Development Course (Required£Elective£ ） Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Mechanical and Electrical EngineeringCollege | | | | | | | | |
| Total study hours | 40 | credit | 2.5 | theoretical study hours | 40 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | Course textbook: 《 Civil Engineering Drawing 》 （ FifthEdition ） Yuan Guo, Hu QingchunEditorsHunan University Press<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

**CourseIntroduction**

《Engineering Drawing》 （Engineering Drawing） is a fundamental course for the Water Supply and Drainage Science and Engineering major, which studies the theories and

methods of drawing and reading engineering drawings, and cultivates students' drawing skills and spatial imagination. It also lays the necessary foundation for students to learn subsequent courses and complete course design and graduation projects. Engineering drawings are important tools for expressing and communicating technical ideas and are essential technical documents in engineering and technology departments. They are also indispensable technical materials for guiding production and construction management. In engineering construction such as water supply and drainage, design is first carried out, drawings are made, and then construction is done according to the drawings. Therefore, civil engineering technicians must be proficient in drawing and reading engineering drawings in their field. Thus, it is essential to include Engineering Drawing as a core technical foundation course in the teaching plan for the Water Supply and Drainage Science and Engineering major.

**Course teaching objectives andthe supported graduation requirements**

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study,develop the ability to read and draw engineering drawings in this field; cultivate engineering awareness and the consciousness to implement and adhere to national standards.

**Course Objectives2:**To cultivate spatial imagination and lay a solid foundation for developing problem analysis skills, problem-solving abilities, creativity, and aesthetic capabilities.

**Course Objectives3:**To cultivate basic skills in computer graphics.

**Course Objectives4:**To cultivate a serious and responsible work attitude and a rigorous, practical, and meticulous work style.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including thought questions, Q&A questions, anddrawing questions, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Zhang WenfangDepartment (Office) Head Review:Zhang WenfangCollege Leadership Review:Zhou Li

# General Chemistry Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | General Chemistry | | | | | Course Number | | 9080112020 | |
| English name | General chemistry | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£CompulsoryR) Independent Development Course (Compulsory£Elective£) Intensive Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 24 | practical study hours | 8 | Machine learning hours | 0 |
| Prerequisite courses | | | | | | | | | |
| Textbooks and reference materials | Course Textbook：Department of General Chemistry, Zhejiang University. General Chemistry[M]. Beijing: Higher Education Press, 2011.06（6th Edition）<br>ReferenceMaterials: Gao Song, General Chemistry, Peking University Press,201308<br>TeachingWebsite:https://www.bilibili.com/video/av8360097/ | | | | | | | | |

## CourseIntroduction

"General Chemistry" (General chemistry) is an essential foundational knowledge course for non-chemical engineering majors in science and engineering fields, playing a significant role in the subsequent study of professional courses and future development. This course is suitable for majors such as Resource Exploration Engineering, Exploration Technology and Engineering (Hydrology, Water Engineering), Gem and Material Technology, Environmental Engineering, Environmental Science, Water Supply and Drainage Engineering, Hydrology and Water Resources Engineering, Resource Environment and Urban-Rural Planning Management, Civil Engineering, and others. Through the study of the theoretical foundations of material structure, chemical kinetics, the basic laws of chemical reactions, and important elements and compounds closely related to engineering practice, as well as new technologies and new materials, students will understand the basic theories of modern chemistry, acquire necessary foundational knowledge and certain basic skills, providing a necessary chemical foundation for future study and work. They will be able to observe material changes from a chemical perspective in engineering technology and have the initial ability to analyze and solve practical problems related to chemical engineering technology. The course aims to cultivate students' correct learning and research methods and gradually establish a dialectical materialist worldview.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

**Course Objectives 1：** Master the knowledge related to the interconnections between chemistry and physics, laying the foundation for solving complex engineering problems in the field of water supply and drainage science and engineering; through course study, understand the relationship between chemistry and physics, use physical methods to solve chemical problems, comprehend the relationship between chemistry and the specialized fields of water supply and drainage science and engineering, physics, etc., and understand the structural system of knowledge in this field, applying it to solve complex engineering problems.

**Course Objectives 2:** Master the principles of natural sciences such as chemistry, mathematics, and university physics, and possess the ability to identify and express key aspects of complex engineering problems; be familiar with the relationship between chemistry and physics, learn to use physical methods to study chemical issues, and combine the principles and research methods of physical chemistry to provide a basis for the selection of schemes for water supply systems, drainage systems, fire protection systems, etc. Possess the ability to conduct systematic analysis of complex building water supply and drainage issues using literature retrieval, data consultation, and other means, and propose corresponding solutions and theoretical bases.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Prepared by:Meng WeiDepartment (Office) Head Review:Wang FengCollege Leadership Review:He Guowen

# Syllabus for 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 of Water and Wastewater Science and Engineering | | |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course □ Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ) Independent Development Course (Required □ Elective □ ) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 16 | credit | 1.0 | theoretical study hours | 16 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Course Textbook: "Introduction to Water Supply and Drainage Science and Engineering" (Second Edition); Li Guibai, Jiang Zhanpeng, Fan Jinchu, Long Tengrui, editors; China Architecture & Building Press;2010.3.<br>Reference materials: design specifications, related textbooks, etc | | | | | | | | |

## CourseIntroduction

Introduction of Water and Wastewater Science and Engineering is a specialized introductory course in the field of water supply and drainage science and engineering. Its purpose and task are to provide a general introduction to the main professional knowledge of this discipline. The course includes knowledge about the relationship between the social cycle of water and this profession, the relationship between 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 economics, water engineering equipment, and automatic control. Through this course, students gain a general understanding of the severe situation of the water resource crisis in our country, a basic understanding of the main content of this discipline, a macro understanding of the foundational theories required by the profession, related disciplines, and modern science and technology, which enhances their interest in learning, boosts their confidence, purposefulness in learning, and determination to engage in the field of water supply and drainage science and engineering.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Familiarizewiththe basic concepts, basic theories, and basic methods related towater supply and drainage, while cultivating students' engineering professional ethics and social responsibility in the process。

**Course Objectives2:**Apply the basic theories and methods of water supply and drainage science and engineering to simple engineering practical problems, stimulating students' awareness of autonomous learning and lifelong learning.

**Course Objectives3:**Understand the composition ofthe discipline system of Drainage Science and Engineeringand the intrinsic connections among the involved multidisciplinary fields.

### (2) Teaching Methods

1. Equal emphasis on classroom teaching and self-study

Mainly based on classroom lectures,interspersed with some animations and examples of engineering applications during the lectures,some content is primarily self-study, while arrangingQ&Aand discussions after class.

2. Exercises

Assign corresponding exercises, including thought questions and Q&A, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.ClassDiscussion

According to the teaching content and class schedulenecessaryclassroom discussions, broaden learning ideas, and improve the ability to analyze and solve problems.

Prepared by:Zhou JunDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Physical Chemistry Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Physical Chemistry | | | | Course Number | 9080112301 | | | |
| English name | Physical Chemistry | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course □ Disciplinary Foundation CourseCore Major Course (Elective□Required□) Independent Development Course (Required□Elective□) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Materials and ChemistrySchool of Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 28 | practical study hours | 4 | Machine learning hours | 0 |
| Prerequisite courses | General Chemistry, Organic Chemistry, Introduction to Water Supply and Drainage Science and Engineering, General Physics, Advanced Mathematics | | | | | | | | |
| Textbooks and reference materials | Textbook: "Brief Course in Physical Chemistry" (Fourth Edition) edited by Yin Yongjia, Xi Zhengkai, and Zhang Shuyuan, Higher Education Press | | | | | | | | |

**CourseIntroduction**

Physical Chemistry（Physical Chemistry） is a fundamental course for the major of Water Supply and Drainage Science and Engineering. It is one of the earliest interdisciplinary edge subjects where physics and chemistry permeate each other, serving as the theoretical foundation for disciplines

such as chemistry, chemical engineering, materials, biology, medicine、 and building water supply and drainage engineering, and is referred to as the "soul of chemistry." This course plays an extremely important role in cultivating students' creativity and improving their quality.The goal of physical chemistry is to further study the universal laws of chemical motion of substances based on the previously learned prerequisite courses, using relevant theories and methods from physics and mathematics。To master physical chemistry well is essential for fundamentally understanding chemical motion, theoretically explaining chemical phenomena, and systematically and profoundly grasping chemical knowledge. Therefore, physical chemistry plays an extremely important role in enhancing students' chemistry level.

The main task of this course is to cultivate students' ability to design building water supply and drainage engineering and to improve the foundation of this technology.Ability.Through the study of this course, students will have a solid foundation in theoretical and professional knowledge, enabling them to quickly adapt to the new demands of emerging industries in the future, cultivate their ability to analyze and solve various problems in chemistry and related disciplines, and foster a good spirit of collaboration, while establishing a dialectical materialist perspective. This will help further solidify the theoretical foundation for learning related professional courses, strengthen students' awareness of independent and lifelong learning, and enhance practical skills and innovative thinking.

The purpose of this course is to further study the universal laws of chemical motion of matter based on the foundation of some prerequisite courses, using relevant theories and methods from physics and mathematics. The syllabus adheres to the principle of connecting theory with practice in a concise manner, enabling students to understand and master the basic theories of physical chemistry, thereby enhancing their ability to analyze and solve problems in teaching and research.

The theoretical teaching content of this course includes: the first law of thermodynamics, the second law of thermodynamics, and chemical potential, totaling three chapters. In order to cultivate students' independent working ability and strengthen professional quality education, the teaching content should distinguish between primary and secondary points, focusing on the key and difficult points of the textbook while adhering to the principle of systematics. Exercise classes are an important teaching link, and teachers must pay attention to them.

The teaching content of this physical chemistry experiment course is: Determination of the relative molecular mass of water-soluble polymers by viscosity method, determination and application of the electromotive force of a galvanic cell (choose one).

**Course teaching objectives andthe supported graduation requirements**

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1: Master the knowledge related to the interconnections between chemistry and physics, laying a foundation for solving complex engineering problems in the field of water supply and drainage science and engineering; through the course study, master the relationship between chemistry and physics, use physical methods to solve chemical problems, understand the relationship between chemistry and water supply and drainage science and engineering, physics, and other related fields, understand the knowledge framework structure 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 possess the ability to identify and express key aspects of complex engineering problems;Familiar with therelationship between chemistry and physics, learn to use physical methods to study chemical problems, combining the principles and research methods of physical chemistry,toprovide a basis for the selection of schemes for water supply systems, drainage systems, fire protection systems, etc.Providethe ability to conduct systematic analysis of complex building water supply and drainage issues using literature retrieval, data consultation, and other means, and propose corresponding solutions and theoretical bases.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

Mainly taught in class, with some content focused on self-study,self-study of the corresponding teaching content of this course on the online platform,while arranging for questions outside of class.

2. Practice andExercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

4. Online teaching

Using the online teaching platform, the learning effect is assessed through assignments and unit exams in the Rain Classroom

Formulated by:Long LipingDepartment (Office) Head Review:Wang FengCollege Leadership Review:He Guowen

# Organic Chemistry Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Organic Chemistry | | | | | Course Number | 9080112200 | | |
| English name | Organic Chemistry | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course □ Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ) Independent Development Course (Required □ Elective □ ) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Materials and Chemical Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 20 | practical study hours | 4 | Machine learning hours | 0 |
| Prerequisite courses | General Chemistry, Introduction to Water Supply and Drainage Science and Engineering etc. | | | | | | | | |
| Textbook-level reference materials | Textbook: "Organic Chemistry" (Fifth Edition)， Department of Organic Chemistry, Tianjin University, Higher Education Press<br>References:Handbook of Organic Compounds, reference materials, etc. | | | | | | | | |

## Course Introduction

The organic chemistry course is a foundational subject for majors such as biotechnology, materials, chemical engineering, environmental science and engineering, and water supply and drainage science and engineering. Organic chemistry is the science that studies the sources, structures, properties, preparation, and applications of organic compounds, as well as related theories and methodologies. Through this course, students will gain a relatively systematic and comprehensive understanding of organic chemistry, recognize the relationship between the structure and properties of organic compounds, become familiar with the interconversion of various organic substances and their laws, and generally understand significant scientific and technological achievements in this field both domestically and internationally. Students will firmly grasp the basic knowledge, foundational theories, and essential skills of organic chemistry, cultivate a dialectical materialist viewpoint, adhere to the principle of linking theory with practice, and develop the ability to analyze and solve problems. This lays a solid foundation for cultivating high-level, interdisciplinary engineering and technical talents in fields such as biotechnology, materials, chemical engineering, environmental engineering, and water supply and drainage science and engineering.

## 2.Course Teaching Objectives and Supported Graduation Requirements

**Course teaching objectives**

Through the theoretical and practical teaching of this course, students will acquire the following abilities:

**Course Objectives1 :** To enable students to master the basic theories of organic chemistry structure, reactions, and organic synthesis methods,to understand the relationship between chemistry and the field of water supply and drainage science and engineering,and to lay a solid foundation for further acquiring knowledge in organic chemistry and subsequent foundational and specialized courses.

**Course Objectives2 :** Guided by the theory of organic chemistry, cultivate students' ability to summarize, logical reasoning ability, self-learning ability, independent thinking ability, and innovation ability,to provide a theoretical basis for the design schemes of water supply and drainage systems in water supply and drainage engineering,enabling students to comprehensively apply the principles and methods of organic chemistry to analyze and solvepractical application problems.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

The main focus is on classroom teaching, with some content primarily for self-study, while also arranging for Q&A and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, such as completion reactions, recommended questions, identification questions, and synthesis questions, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Qi FengpeiDepartment (Office) Head Review:Wang FengCollege Leadership Review:Zhang Saiwen

# Syllabus for Electrical Engineering and Electronics Course

| | | | |
|---|---|---|---|
| Course Name | ElectricalEngineering Electronics | Course Number | 9061312300 |
| English name | Electrical engineering and electronics | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course □ Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | Information and Electronic Engineering College | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 28 | practical study hours | 4 | Machine learning hours | 0 |
| Prerequisite courses | University PhysicsStudy,AdvancedMathematicsetc. | | | | | | | | |
| Textbooks and reference materials | Course textbook: 《Electrical Engineering Simplified Tutorial》 (3rd edition) Qin Zenghuang, chief editor Higher Education Press<br>Reference: "Fundamentals of Electronic Technology" edited by Kang Huaguang, Higher Education Press and Industrial Press.<br>"Fundamentals of Analog Electronic Technology" edited by Gu Lei and Zhang Xuejun, University of Electronic Science and Technology Press. | | | | | | | | |

## CourseIntroduction

"Electrical and Electronic Technology" is a foundational technical course for students in non-electrical engineering majors. It integrates electrical technology and electronic technology, focusing on the introduction of basic concepts and applications of electrical and electronic technology. The course content mainly includes circuits and circuit components, basics of circuit analysis, basic circuits of discrete components, digital integrated circuits, integrated operational amplifiers, waveform generation and transformation, measurement and data acquisition systems, power electronic circuits, and electrical control technology, among others. It lays a certain foundation for subsequent courses or for engaging in engineering technical work related to this major..

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study,students should understand the meaning of circuit models and basic physical quantities; understand and master basic theorems, laws, and fundamental analysis methods; understand and master the phasor representation of sinusoidal alternating current and the phasor analysis methods in circuits。

**Course Objectives2：** Through the course study, students should understand the working principles and performance characteristics of common-emitter single transistor amplifier circuits and emitter followers; master the methods for dynamic and static analysis of common-emitter single transistor amplifier circuits, emitter followers, and the RC-coupled multi-stage amplifier circuits they form; master the application of ideal operational amplifiers in signal processing; and master the analysis methods for single-phase rectification, capacitor filtering, and integrated voltage regulator circuits.

**Course Objectives3:**Master the analysis and design methods of simple combinational logic circuits; be able to analyze simple sequential logic circuits.

**Course Objectives4:**By integrating the connections between electrical engineering and water supply and drainage science and engineering, as well as the needs of scientific research and production in teaching, guide students to learn knowledge more authentically, understand principles, master laws, and enhance their engineering practice and innovation abilities.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:ZhangDirector of the Academic Department (Office) Review:HuLeadership Review of the Academy:CaoBu Wen

# Syllabus for Engineering Mechanics

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Engineering Mechanics | | | | | Course Number | | 9034112101 | |
| English name | Engineering Mechanics | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course □ Disciplinary Foundation CourseCore Major Course (Elective □ Required □ ) Independent Development Course (Required □ Elective □ ) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | CivilEngineering College | | | | | | | | |
| Total study hours | 40 | credit | 2.5 | theoretical study hours | 40 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics, University Physics | | | | | | | | |
| Textbooks and reference | Textbook: "Architectural Mechanics" (Second Edition) edited by Li Yongshuo and Guo Jian, Wuhan University of Technology Press. | | | | | | | | |

| | |
|---|---|
| materials | References:"Engineering Mechanics" (Third Edition) edited by Fan QingshanTsinghua University Press |

## CourseIntroduction

《Engineering Mechanics》（Engineering Mechanics） is a fundamental course in the field of water supply and drainage science and engineering that serves as a foundational discipline for studying the basic issues of force balance, internal forces, strength, stiffness, and stability of building components. It is an engineering discipline that examines the strength of buildings and their components, as well as their stiffness and stability, which are the most critical and fundamental issues to ensure safe usage. These factors directly affect the living conditions of occupants in buildings and the effectiveness of various activities, as well as the safety of life and property, and they also influence the rationality of engineering costs. The goal of the course is to understand the position and role of engineering mechanics in construction. Students will master basic concepts such as internal forces, strength, stiffness, and stability, and gain a preliminary understanding of the fundamental principles, theories, and methods of theoretical mechanics (statics) and material mechanics. They will also understand the significance and basic methods of abstracting practical problems in engineering practice into mechanical models, and comprehend the basic forms of truss structures (models) in engineering applications.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching of this course, students will acquire basic knowledge and skills. The specificcourseobjectives are as follows:

Through the course study, students understand the research tasks of engineering mechanics, learning methods, the relationship between engineering mechanics and other courses, and comprehend the knowledge system of the engineering mechanics course and the course requirements for the water supply and drainage specialty.

Understand the basic assumptions of deformable solids; master the basic concepts of strength, stiffness, and stability.Master the force analysis of planar force systems, and understand the simplified basic equilibrium calculations of planar concurrent force systems, couple systems, and arbitrary force systems. Master the calculation of support reactions for simple rod structures and have a preliminary understanding of spatial force system problems.

Understand the concepts and characteristics of common basic deformations of rods. Master the concept of internal forces under basic deformations of rods, the section method, and other methods for calculating internal forces and drawing internal force diagrams. Master the stress-strength and deformation-stiffness calculations; understand the concepts of Hooke's law, elastic modulus, and Poisson's ratio; master the tensile and compressive mechanical properties of rods made of different materials, and the establishment and calculation of strength conditions. Understand stress concentration and the characteristics of stress distribution in oblique sections.

Use the static equilibrium equations to solve for the support reactions of engineering components; analyze the internal forces and stress distribution of simple tension and compression members, as well as planar bending members in engineering examples, to address simple strength issues.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Jiang LeiDepartment (Office) Head Review:He YeCollege Leadership Review:Wang Xinzong

# Hydraulics Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Hydraulics | | | | Course Number | 9021312021 | | | |
| English name | Hydraulics | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 56 | credit | 3.0 | theoretical study hours | 40 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics, Engineering Mechanics | | | | | | | | |
| textbook | Course Materials:Edited by Zhang Weijia, Hydraulics (Second Edition), China Architecture & Building Press,2015 | | | | | | | | |

## Course Introduction

Hydraulics is a major foundational course in the field of water supply and drainage science and engineering. Its main task is to enable students to master the general laws of fluid

motion, as well as the basic concepts, fundamental theories, basic methods of hydraulic calculations, and essential experimental skills related to it. Through this course, students will learn to analyze hydraulic problems, develop the ability to solve related engineering issues, and lay a foundation for studying subsequent specialized courses, engaging in professional technical work, exploring new technological fields, and conducting scientific research.

## 2. Course Teaching Objectives andSupported Graduation Requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** 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 Objectives2：** Master the basic principles of hydraulics, analyze and identify complex engineering problems in this field, and be able to use literature resources to initially possess the ability to accurately express, analyze, and solve practical engineering problems;

**Course Objectives3:**Be able to familiarize oneself with the operation methods of hydraulic experimental instruments and equipment, write hydraulic experiment reports, clearly express personal viewpoints, and possess the awareness and skills to conduct experimental research on solving complex hydraulic engineering problems, as well as preliminary abilities in engineering communication and exchange.

### (2) Teaching Methods

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and masteryof the content taught in class, cultivating students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Li YuanpingDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Syllabus for Water Analytical Chemistry

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Analytical Chemistry | | | | | Course Number | 9021312031 | | |
| English name | Water Analytic Chemistry | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 40 | credit | 2.0 | theoretical study hours | 24 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | General Chemistry、Organic Chemistry、Physical Chemistry, etc. | | | | | | | | |
| Textbooks and reference materials | Textbook: "Water Analysis Chemistry" (Fourth Edition) edited by Huang Junli and Wu Mingsong, China Architecture & Building Press.<br>References:Related standards, specifications, manuals, andtextbooks, etc. | | | | | | | | |

## CourseIntroduction

《Water Analytic Chemistry》（Water Analytic Chemistry）is a major foundational course for the Water Supply and Drainage Science and Engineering major, and it is also one of the ten key courses established by the professional advisory committee. It is a discipline that studies the composition, properties, content of water and its impurities and pollutants, as well as their analytical methods. The teaching objectives and tasks of this course are to help students establish an accurate concept of "quantity," enabling them to make correct judgments and evaluations regarding water supply and drainage engineering design, water treatment processes, water environment quality assessment, and the effectiveness of wastewater comprehensive utilization. Through the course, students will master the four major titration methods in water analytic chemistry (acid-base titration, complexometric titration, precipitation titration, and redox titration) and the basic principles, knowledge, theories, and skills of major instrumental analyses (such as absorption spectroscopy, gas chromatography, and atomic absorption). Through experimental teaching, students will correctly master the basic operations of water analytic chemistry; the entire teaching process will emphasize cultivating students' rigorous scientific attitudes and their ability to independently analyze and solve problems. Through this course, students will develop skills in water quality engineering analysis, laying a foundation for future related courses, graduation requirements, and future work in production and scientific research.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1:**Through the course study, master the knowledge of water analytical chemistry and apply it to solve complex engineering problems in this field, while establishing a good sense of professional ethics and social responsibility in students.

**Course Objectives2:**Be able to apply the basic theories and fundamental analytical methods of water analytical chemistry to obtain engineering survey information, analyze related issues, and propose effective solutions to the problems..

**Course Objectives3:**Be able tofamiliarize oneself with the operation methods of experimental instruments and equipment related to water analytical chemistry, and possess the awareness and skills to conduct experimental research aimed at solving complex problems in water analytical chemistry.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging forQ&Aand discussion after class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems。

Formulated by:Li GuohuiDepartment (Office) Director Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Teaching Outline for Civil Engineering Fundamentals

| | | | |
|---|---|---|---|
| Course Name | Civil engineering foundation | Course Number | 9032112240 |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| English name | Introduction of Civil engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective□Required□) Independent Development Course (Required£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Engineering drawing, theoretical mechanics, computer fundamentalsetc. | | | | | | | | |
| Textbooks and reference materials | Course Textbook: Segment Tree by Jin Xiangzhong on Introduction to Civil Engineering (2ndEdition)[M]. Chongqing University Press, 2018.05.<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## CourseIntroduction

《Fundamentals of Civil Engineering》（Introduction of Civil engineering）is a required course for the four-year undergraduate program in Water Supply and Drainage Science and Engineering. Based on the latest technical standards and regulations in civil engineering in our country, it introduces the history, current status, achievements, and development trends of civil engineering both domestically and internationally. This course mainly familiarizes students with the basic knowledge of various civil engineering facilities, including their structure, classification, and characteristics, as well as understanding the responsibilities and obligations of civil engineers. The course content specifically includes an introduction, the responsibilities and obligations of civil engineers, civil engineering materials, foundation engineering, geotechnical and underground construction, building engineering, road engineering, bridge engineering, rail transit engineering, tunnel engineering, hydraulic structures, port engineering structures, disaster prevention and reduction in civil engineering, and the sustainable development of civil engineering.

Through this course, students transition from confusion about the civil engineering major to understanding it, and ultimately to loving the profession. This helps students recognize the status and role of civil engineering, understand the training objectives and teaching content of the civil engineering major, establish a correct learning perspective and engineering awareness, stimulate their learning potential for future studies, and lay a solid foundation of thought and methods.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Through the theoretical teaching of this course, students will acquire basic knowledge and skills. The specific course objectives are as follows:

**Course Objectives1：** Familiarize with the history, development, status, and role of the civil engineering profession.

Course Objective 2: The responsibilities and obligations of civil engineers.

**Course Objectives3:**Familiarize with the concepts, classifications, components, and characteristics of construction engineering, bridge engineering, road engineering, and rail transit engineering, and understand the classifications, components, and characteristics of tunnel engineering, hydraulic engineering structures, and port engineering structures.

**Course Objectives4:**Understand the basic methods, procedures, and organizational design of civil engineering construction.

**Course Objectives5:**Understand the main types of disaster reduction and prevention in civil engineering and the key points of disaster prevention.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:He Ran/Cai JingyaoDepartment (Office) Director Review:He RanCollege Leadership Review:Wang Xinzong

# Syllabus for Hydrology and Hydrogeology

| | | | |
|---|---|---|---|
| Course Name | Hydrology and Hydrogeology | Course Number | 9036112180 |
| English name | Hydrology & Hydrogeology | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course□ | | |
| Course Offering Unit | CivilEngineering College | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 32 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics,Foundation of Civil Engineeringetc. | | | | | | | | |
| Textbooks and reference materials | Course materials:Edited by Wang Xiaoling, Han Bing, and Song Tiehong, "Hydrology and Hydrogeology," China Architecture Industry Press,2015year<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## 1. Course Introduction

"Hydrology and Hydrogeology" is a core required course for the Water Supply Science and Engineering major. Through this course, students will master the basic principles of hydrology and learn the fundamental methods of hydrological analysis and calculation; grasp basic geological concepts, the physical and chemical properties of groundwater, the basic characteristics of groundwater occurrence and evolution, as well as preliminary knowledge for selecting and designing general groundwater supply sources.

## 2. Course teaching objectives and the graduation requirements they support

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Teaching Objectives1：** Through the course study, master the basic principles and basic calculation skills of hydrology, and be able to apply them to solve complex engineering problems in this field, enhancing students' sense of social responsibility.

**Course Teaching Objectives2:**Through the course study, understand the analytical and computational methods for situations of sufficient, insufficient, and lack of data, master the basic principles and fundamental calculation skills of hydrology, and be able to identify hydrological engineering problems in this field, as well as accurately express them using engineering language such as drawings, charts, and technical reports.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Li ZhipingDepartment (Office) Director Review:Ji WeiCollege Leadership Review:Wang Xinzong

# Teaching Outline for Pumps and Pump Stations

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Pumps and pump stations | | | | Course Number | 9021312041 | | | |
| English name | Pump and Pump station | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2 | theoretical study hours | 28 | practical study hours | 4 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, engineering drawing, fundamentals of civil engineering | | | | | | | | |
| Teaching materials and resources | Textbook: Zhang Wei, Zhou ShukaiPumps and Pump Stations[M].Beijing: Peking University Press,2014<br>Reference materials: relevant standards, specifications, design manuals, etc | | | | | | | | |

## Course Introduction

"Pumps and Pump Stations" is one of the important foundational courses in the field of water supply and drainage science and engineering. The course aims to familiarize students with the basic structure, working principles, and main performance parameters of commonly used water pumps in water supply and drainage engineering; to master the basic equations of pumps and their characteristic curves; to understand the determination of pump operating conditions and the principles and methods of adjusting these conditions; to master the selection of pumps and the determination of their operating conditions in series and parallel; and to grasp the basic knowledge of the process design, flow, and methods of water supply and drainage pump stations.Additionally, students will learn about the basic knowledge of pump station operation management, and the use and maintenance of units.

## Course teaching objectives and the supported graduation requirements

### 1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1:Master the basic structure, working principle, basic performance parameters, and characteristic curves of commonly used pumps in water supply and drainage engineering, as well as the numerical and graphical methods for solving the operating conditions of pumps at a constant speed and the principles and methods for adjusting operating conditions.

Course Objective 2: Master the process characteristics and basic design calculation methods of water supply pump stations and drainage pump stations, solve problems in pump station process design such as pump selection, pipeline systems, and the design of auxiliary facilities, and possess the ability to use relevant standards, specifications, and design manuals to complete pump station process design. Establish a goodlife values, socialprofessional ethics andsense of responsibility, enabling students to have good engineering ethics.

Course Objective 3:To be able to use basic knowledge and fundamental theories to draw characteristic curves and perform operation and maintenance of pumps, possessing certain abilities in pump station operation management and scheduling.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

The main focus is on classroom teaching, with some content primarily for self-study, while also arranging for Q&A and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Experiment

In conjunction with classroom teaching, organize corresponding experiments to acquire necessary empirical knowledge.

4. Thematic Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by: Wang Caiwen, Department (Office) Director Reviewed by: Wang Aihe, College Leadership Reviewed by: Li Yongsuo

# Syllabus for Teaching Water Treatment Biology

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Treatment Biology | | | | | Course Number | 9021312051 | | |
| English name | Biology for Water Treatment | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course □ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 48 | credit | 2.5 | theoretical study hours | 32 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | Courses in general chemistry, organic chemistry, and water analysis chemistry | | | | | | | | |
| Textbooks and reference materials | Course Textbook：“Water Treatment Biology” (6th Edition) edited by Gu Xiasheng, Hu Hongying, et al., China Architecture & Building Press,2018.<br>Reference: "Microbiology in Environmental Engineering"(Fourth Edition)Edited by Zhou Qunying and Wang Shifen, Higher Education Press,2015.<br>"Microbiology Experiments in Water Treatment"(Second Edition)Edited by Wang Jialing, Beijing: Higher Education Press,2004. | | | | | | | | |

## CourseIntroduction

“Biology for Water Treatment” is a required foundational course for the major of Water Supply and Drainage Science and Engineering. The main task of this course is to require students to deeply understand the basic knowledge of microorganisms and the application of microbial principles in water pollution control and water supply, based on a certain background of chemistry and knowledge related to water treatment engineering. This provides a theoretical and experimental foundation in microbiology for studying environmental pollution control and drainage engineering. Through the theoretical and experimental teaching of the course “Water Treatment Microbiology,” students will master the basic concepts and theories of water treatment biology and its applications in water treatment, as well as the research methods and basic operational skills in microbiology, cultivating the ability for theoretical analysis, innovative thinking, and solving practical problems, thereby laying a necessary biological foundation for the subsequent study of various specialized courses.

## Course teaching objectives andthe supported graduation requirements

### 1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Familiarize with the morphology and structure of bacteria, master their physiological characteristics, growth, and genetic variation， cultivate students' pragmatic research spirit, and establish good professional ethics and moral concepts。

**Course Objectives2:**To cultivate students' professional qualities and guide them to masterthe characteristics of viruses (bacteriophages), filamentous fungi, and eukaryotic microorganisms, and to become familiar with common microorganisms and their roles in water treatment.

**Course Objectives3:**Master the characteristics and control methods of pathogenic microorganisms in water, master the coliform group and its determination methods, cultivate students' ability to solve problems using scientific methods, and establish awareness of water ecological health and safety.

**Course Objectives4:**To cultivate students' sense of social responsibility, enabling them to recognize the role of this course in environmental protection, society, and health,to master the mechanisms of microbial degradation and transformation of pollutants, to understand the microbial degradation pathways of typical organic compounds and the biotransformation processes of inorganic elements, and to grasp typical biological treatment methods for wastewater and their microbial characteristics,

**Course Objectives5:**Require students to master the basic theoretical knowledge of water treatment microorganisms, enabling them to be familiar with the theoretical foundations of microorganisms in water treatment engineering research, design, debugging, and operation, cultivate students' ability to solve complex problems in this field, and instill a belief in serving the country.

(2) Teaching Methods

1.Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2.Exercises

Each chapter includes corresponding exercises, such as multiple-choice questions, true or false questions, discussion questions, and Q&A, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Experiment

In conjunction with classroom teaching, organize corresponding experiments to acquire necessary empirical knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Director Jiang Haiyan (Office) Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Teaching Water Engineering Economics and Budgeting

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Engineering Economics and Budgeting | | | | | Course Number | | 9021112060 | |
| English name | Economics and Budget Estimating for Water Engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course□Disciplinary Foundation Course□Core Major Course (Elective□Required） Independent Development Course (Required□Elective□） Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | None | | | | | | | | |
| Textbooks and reference materials | Course Textbook: "Hydraulic Engineering Budgeting and Technical Economic Evaluation," edited by Xiao Zuoyi, Machinery Industry Press,2011 year April, 21 century higher education planning textbook series for water supply and drainage engineering.<br>References:Pricing standards, related quotas etc.. | | | | | | | | |

## CourseIntroduction

《水工程经济与概预算》（Economics and Budget Estimating for Water Engineering）is a required course for the major of Water Supply and Drainage Science and Engineering. Through the study, students are expected to master the basic principles, evaluation indicators and methods of economic analysis in water supply and drainage technology, the content and methods of project financial evaluation and national economic evaluation, become familiar with the basic principles and methods of engineering budget estimation, develop practical skills in calculating project costs, and understand the development trends of engineering budget estimation. This is of great significance for cultivating the basic economic literacy and management decision-making abilities of engineering students.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Students are required to master the basic principles, evaluation indicators and methods of water supply and drainage technology economic analysis, as well as the content and methods of project financial evaluation and national economic evaluation, and to be able to conduct reasonable economic evaluations of projects.

**Course Objectives2:**Students are required to master the basic principles and methods of engineering cost estimation, become familiar with the use of relevant cost estimation software, and develop the ability to engage in engineering cost estimation work.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly based on classroom teaching, with some content focused on self-study, while arrangingpost-class Q&Aand discussions.

2. Exercises

Each chapter includes corresponding exercises, includingcalculations and questions etc., to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.ClassDiscussion

According to the teaching content and class schedulenecessaryclassroom discussions, broaden learning ideas, and improve the ability to analyze and solve problems.

Prepared by:Zhou JunDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Teaching Water Resource Utilization and Protection

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Utilization and Protection of Water Resources | | | Course code | | 9021113070 | | | |
| English name | Utilization and Protection of Water Resources | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course □ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | | Machine learning hours | |
| Prerequisite courses | Hydraulics, hydrology, and hydrogeology | | | | | | | | |
| Textbooks and | Textbook: Utilization and Protection of Water Resources (Third Edition), edited by Li Guanghe, China Architecture & Building Press,2018year. | | | | | | | | |

| | |
|---|---|
| reference materials | Reference materials: design manuals, specifications, related textbooks, etc. |

Course Introduction

"Utilization and Protection of Water Resources" is one of the main courses in the field of Water Supply and Drainage Science and Engineering. Through this course, the aim is to enable students to gain a comprehensive and in-depth understanding of the global water resource situation, the characteristics of formation and distribution, and the current status of development and utilization. Students will systematically learn and master the basic concepts and theoretical methods of water resource cycles and balances, as well as water resource evaluation and research; comprehensively learn and master the types, layout principles, layout methods, applicable scope, and applicable conditions of water resource utilization engineering related to water supply, as well as the relevant technical parameters for the operation of water resource utilization projects; and learn and master the concepts, theories, and methods of rational planning of water resources, joint scheduling of various water bodies, scientific management, and water pollution prevention and control, laying a theoretical and technical foundation for the future rational utilization and protection of water resources.

Course teaching objectives and the supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** To enable studentsto gain an in-depth understanding of the global water resource situation, its formation and distribution characteristics, and the current status of development and utilization. Students will master the basic concepts and theoretical methods related to water resource cycles and balances, as well as water resource evaluation and research. The aim is to cultivate students' ability to apply basic knowledge of water resource protection and utilization to solve related engineering problems, and to instill a strong sense of professional ethics and social responsibility.

**Course Objectives2：** To cultivate students' professional qualities, guide students to master the types, layout principles, layout methods, applicable scope, and applicable conditions of water resource utilization projects related to water supply, as well as the relevant technical parameters for the operation of water resource utilization projects; to develop students' preliminary ability to design water resource utilization projects.

**Course Objectives3:**To cultivate students' sense of social responsibility, enabling them to understand the role of this course in environmental protection, society, energy conservation, etc., and to master the concepts, theories, and methods of rational planning of water resources, joint scheduling of various water bodies, and scientific management, as well as water pollution prevention and control, laying a theoretical and technical foundation for the future rational use and protection of water resources.

TeachingMethods

Emphasis on both classroom teaching and self-study

The main focus is on classroom teaching, with some content primarily for self-study, while also arranging for Q&A and discussions outside of class.

Exercises

Each chapter assigns corresponding exercises based on the difficulty level and quantity of knowledge points, deepening the understanding and mastery of the content taught in class, and cultivating students' ability to think independently, analyze, and solve problems.

Thematic discussions and practical courses

In conjunction with classroom teaching, organize corresponding on-site visits and thematic discussions to guide students in connecting theory with practice, broaden their horizons, and cultivate their ability to solve complex engineering problems.

Formulated by:Deng YumeiDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Water Supply and Drainage Pipeline Network System (1)Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Supply and Drainage Pipeline Network System (1) | | | | | Course Number | 9021113081 | | |
| English name | Water-Supply and drainage Engineering（1） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Courses£Disciplinary Foundation Courses£Core Major Courses (Elective£CompulsoryR) Independent Development Courses (Compulsory£Elective£) Concentrated Practice Courses£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 32 | practical study hours | 0 | Machine learning hours | 0 |

| | |
|---|---|
| Prerequisite courses | Hydraulics,Pumps and Pump Stations |
| Teaching materials and resources | Course Textbook:Yan Xushi, Gao Naiyun“Water Supply Engineering (Volume 1)”[M].Beijing:Construction Industry Press,2020<br>References: relevant standards and specificationsregulations, design manuals, etc. |

**Course Introduction**

《Water Supply and Drainage Pipeline Network System (1）》（Water-Supply and Drainage Engineering（1））is one of the important specialized courses in the field of water supply and drainage science and engineering.Through the course, students will master the composition of water supply systems, water demand forecasting and water plant sizing, hydraulic calculations and verification of pipeline networks, layout planning and optimization calculations of pipeline systems, and technical management of pipeline networks. They will also be able to combine design manuals, standards, regulations (codes), standard atlases, etc. to have preliminary planning and design capabilities for water supply pipeline systems.

**Course teaching objectives and the supported graduation requirements**

1. Course Teaching Objectives

Through this courselearning, students will acquire the following abilities:

Course Objective 1:Master the core knowledge system of water supply network systems proficiently, and be able to apply theoretical knowledge to engineering practice,establish a good sense of professional ethics and social responsibility.

Course Objective 2:To possess good scientific literacy and a solid engineering foundation, to scientifically and reasonably analyze the key factors of complex engineering problems in water supply networks, and to have the basic ability to distill the essence of complex engineering issues in water supply systems and propose effective solutions.

Course Objective 3:Master the planning, design principles, calculation methods, and processes of urban water supply pipeline systems, and possess the ability to solve complex engineering problems. Through engineering practice,cultivate students' socialresponsibility,and establish the belief in serving the country.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

The main focus is on classroom teaching, with some content primarily for self-study, while also arranging for Q&A and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Wang CaiwenDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Water Supply and Drainage Pipeline Network System (2) Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water supply and drainage system pipeline network (2) | | | | Course Number | 9021113091 | | | |
| English name | Water-Supply and drainage Engineering（2） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course□Core Major Course (Elective□RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 32 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, pumps and pump stations,hydrology and hydrogeologyetc. | | | | | | | | |
| Textbooks and reference materials | Course Textbook: "Drainage Engineering" (Volume 1) (Fifth Edition), edited by Sun Huixiu, China Architecture & Building Press, 2015<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

**CourseIntroduction**

《The Water Supply and Drainage Pipeline Network System (2）》（Water-Supply and Drainage Engineering（2））is one of the required courses for the Water Supply and Drainage Science and Engineering major, teaching the collection, transportation, and discharge of sewage in water supply and drainage engineering, as well as the collection, transportation, and discharge of rainwater through pipeline systems. It systematically discusses the composition of drainage systems, the determination of drainage systems, the calculation of urban sewage volumes, and the hydraulic calculation theories and methods for sewage and rainwater pipelines, enabling students to plan and design drainage pipeline engineering and prepare related documents, while mastering the relevant content of engineering optimization design theories and methods; understanding the development

process and direction of science and technology in drainage pipeline systems, and initially developing the ability to analyze and solve theoretical and practical engineering problems.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives 1:**Enable students to master the basic concepts, functions, and system components of water supply and drainage pipeline systems, cultivate students' ability to apply basic knowledge of water supply and drainage network systems to solve related engineering problems, and establish a good sense of professional ethics and social responsibility.

**Course Objectives 2:** Cultivate students' professional qualities, guide students to master the calculation of wastewater volume in drainage network systems and the theoretical and methodological aspects of hydraulic calculations in network systems, enabling them to design network systems; cultivate students' understanding, mastery, and analytical application abilities of the basic theories of drainage network systems. They should be able to use literature resources and initially possess the ability to analyze and solve theoretical and practical engineering problems.

**Course Objectives 3:** Cultivate students' sense of social mission, enabling them to recognize the role of this course in environmental protection, society, and health, understand the planning and design of drainage network systems; understand the basic skills in the operation and management of drainage network systems. Broaden students' horizons, utilize the introduction of professional engineering to cultivate students' engineering ethics and morals, stimulate students' enthusiasm for learning, and establish the belief in serving the country.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by:Zhang Chun/Yan HengzhenDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Teaching Syllabus for Building Water Supply and Drainage Engineering

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Building Water Supply and Drainage Engineering | | | | | Course Number | | 9021313101 | |
| English name | Building Water Supply and Drainage Engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 48 | credit | 3.0 | theoretical study hours | 48 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, pumps and pump stations, water analytical chemistryetc. | | | | | | | | |
| Textbooks and reference materials | Textbook: "Architectural Water Supply and Drainage Engineering" (7th Edition) edited by Wang Zengchang, China Architecture & Building Press.<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## CourseIntroduction

Building Water Supply and Drainage Engineering is a core course in the major of Water Supply and Drainage Science and Engineering. It studies the supply of water for industrial and civil buildings, residential community domestic water, fire-fighting water, and the collection, treatment, and discharge of sewage (wastewater) to meet the needs of life and production, and to create a sanitary, safe, and comfortable living and working environment. In modern buildings, water supply and drainage is one of the essential engineering systems, and the quality of its design directly affects the living conditions of residents and the effectiveness of various activities, as well as the safety of life and property, and the rationality of project costs. In practical construction, the demand for building water supply and drainage designers is significantly greater than that for designers in other areas of this major, making the effective teaching of this course one of the prominent important aspects of this field. The main task of this course is to cultivate students' ability to design building water supply and drainage engineering and to improve this technology.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study, master the types of building water supply and drainage systems, understand the relationship between the water supply and drainage science and engineering major and other majors such as architecture and building environment, comprehend the knowledge framework structure of this major, and be able to apply it to solve complex engineering problems.

**Course Objectives2:**Familiarize with the design specifications related to building water supply and drainage, master the basis for selecting schemes for water supply systems, drainage systems, fire protection systems, etc., and possess the ability to conduct systematic analysis of complex building water supply and drainage issues using literature retrieval, data consultation, and other means, proposing corresponding solutions and theoretical bases.

**Course Objectives3:**Master the characteristics and requirements of building water supply and drainage systems, master the theoretical calculation methods of building water supply and drainage systems, and master the basic methods and processes of building water supply and drainage design.

**Course Objectives4:**Be able to analyze and evaluate the impact of designs such as fire protection on society, health, safety, law, and culture, and understand the responsibilities that should be undertaken.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Prepared by: Wang Aihe/Director of the Deng Jie Department (Office) Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Water Quality Engineering (1) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Quality Engineering (1） | | | | Course Number | 9021113111 | | | |
| English name | Water Quality Engineering（1） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | MajorRequiredCourse | | | | | | | | |
| Total study hours | 40 | credit | 2.5 | theoretical study hours | 40 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, water supply and drainage pipeline network system | | | | | | | | |
| Reference textbook | "Water Supply Engineering(Fourth Edition)" edited by Yan Xishi and Fan Jinchun, China Architecture & Building Press 2004<br>"Calculation of Process Equipment for Water Treatment Structures" by Li Hongbing, China Architecture & Building Press,1999 | | | | | | | | |

## 1.CourseIntroduction

Water Quality Engineering (1) is a core course in the major 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 of water properties, source water quality characteristics, and water quality indicators; to master the basic concepts, theories, methods, and development status of physical, chemical, and physicochemical treatment methods for water; to have a basic grasp of the engineering principles and methods, application conditions, as well as new processes and technologies for urban water treatment and industrial water treatment, laying a theoretical and practical foundation for future work in engineering design, scientific research, and operational management in this field, and cultivating students' basic abilities in the design, operational management, and scientific research of water treatment engineering.

## 2. Course teaching objectives and the graduation requirements they support

### 1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the study of theoretical knowledge in Water Quality Engineering (I), become familiar with the conventional and advanced treatment process flows of water treatment plants and the knowledge framework in the water treatment process, and be able to apply its basic principles to solve complex engineering problems;

**Course Objectives2：** To have the ability to systematically analyze complex engineering problems in water treatment using literature retrieval, data consultation, and other means, and to provide a basis for proposing effective solutions to complex engineering problems;

**Course Objectives3:**Be able to proficiently master the calculation methods and processes for water treatment engineering planning and design;

**Course Objectives4:**Initially possess the ability to apply experimental research conclusions to solve complex engineering problems in water treatment;

**Course Objectives5:**Be able to analyze and evaluate the impact of water supply engineering practices and complex engineering problem-solving solutions on society, health, safety, law, and culture, and understand the responsibilities that should be undertaken;

**Course Objectives6:**Be able to design a plan for water treatment engineering, clearly express personal views, and possess basic engineering communication and interaction skills.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

This course is mainly taught in class, with some content focused on self-study, and also includes Q&A and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Practical Teaching

In conjunction with the teaching content of this course, experiments such as mixing, sedimentation, filtration, adsorption, and desalination should be conducted. At the same time, organize relevant on-site visits to gain necessary experiential knowledge.

4. Special Discussion

According to the teaching content and classschedule, necessary thematic discussions are arranged to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by: Zhang Chun/Reviewed by: Li Yuanping (Office) Director: Wang Aihe College Leadership Review: Li Yongsuo

# Water Quality Engineering (2) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Quality Engineering (2) | | | | Course Number | 9021113121 | | | |
| English name | Water Quality Engineering（2） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course□Core Major Course (Elective□RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 40 | credit | 3.0 | theoretical study hours | 40 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, pumps and pump stations, water analytical chemistry、water supply and drainage pipe network system (2) etc. | | | | | | | | |
| Textbooks and reference materials | Textbook: "Water Pollution Control Engineering" (Volume 2) (Fourth Edition) edited by Gao Tingyao, Gu Guowei, and Zhou Qi, Higher Education Press.<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## CourseIntroduction

《Water Quality Engineering》（Water Quality Engineering（2）） is a core course in the major of Water Supply and Drainage Science and Engineering. This course systematically introduces the properties of urban sewage, the characteristics and hazards of water pollution, and the self-purification of water bodies, focusing on the theories and applications of physical treatment of sewage, biological treatment theories and applications, natural biological treatment theories, sludge treatment theories and applications, as well as common sewage (sludge) treatment process systems; it also covers the theories and applications of physical treatment, chemical treatment, and physicochemical treatment of industrial wastewater.

Through this course, students will master the basic principles of water treatment, gain a comprehensive and systematic understanding of the properties of water in the social cycle, the water quality characteristics and standards of urban sewage, basic concepts and theories of water pollution and self-purification, and solidly grasp the basic concepts, theories, methods, and development status of water treatment. They will also have a basic understanding of the engineering technologies and methods of water treatment, application conditions, as well as new processes and technologies, laying a necessary theoretical and practical foundation for future work in engineering design, scientific research, and operational management in this field. Students will be trained to have the preliminary ability to design and calculate various structures and process systems in water quality engineering, establishing a necessary theoretical and practical foundation for future work in water engineering design, scientific research, and operational management.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study, familiarize with the determination of design flow and design water quality for wastewater treatment plant design, understand the selection of wastewater treatment process systems and treatment structures, understand the relationship between the Water Supply and Drainage Science and Engineering major and otherrelated majors, comprehend the knowledge framework structure of this major, and be able to apply it to solve complex engineering problems; broaden students' horizons, utilize the introduction of professional engineering to cultivate students' engineering ethics, stimulate students' learning enthusiasm, and establish the belief of serving the country. Establish good professional ethics and social responsibility.

**Course Objectives2:**Master the properties and pollution indicators of urban wastewater, understand the outlets and discharge standards of wastewater, comprehend the characteristics of various structures, and possess the ability to systematically analyze complex water treatment engineering problems using literature retrieval and data consultation, in order to propose corresponding solutions and theoretical bases.

**Course Objectives3:**Master the characteristics of various types of urban sewage and their most suitable treatment processes and workflows, master the design calculations of water treatment processes, master the calculation methods and processes for engineering planning and design in this field, and be able to design reasonable solutions for complex engineering problems.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Yan HengzhenDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Water Engineering Construction Teaching

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water engineering construction | | | | | Course Number | 9021113130 | | |
| English name | Water Project Construction | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice Course □ | | | | | | | | |
| Course Offering Unit | School of Civil Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Building water supply and drainage engineering, hydraulic equipment foundations, water quality engineering, water supply and drainage pipeline systems, etc. | | | | | | | | |
| Textbooks and reference materials | Course Textbook： Shaolin GuangWater Engineering Construction[M].Beijing： China Architecture and Building Press,2012<br>References: Design Manual, Specifications, Relevant Standards, Related Textbooks etc. | | | | | | | | |

**CourseIntroduction**

Water Project Construction is one of the important foundational courses in the field of water supply and drainage science and engineering. It has strong comprehensiveness and practicality. Through the study of this course, students will understand the properties and performance of water supply and drainage structures and pipelines; understand the performance and usage methods of mechanical equipment in this field; master the construction theories and methods of engineering in this field, as well as the practical skills for on-site operations; enhance their design capabilities in water engineering, allowing them to consider construction process requirements in their designs and create water engineering structures that meet construction requirements and facilitate project execution. They will also understand and master the basic principles and methods of modern scientific construction management, enabling them to reasonably select construction plans, methods, and organize the preliminary capabilities for water supply and drainage project construction based on specific engineering conditions.

**Course teaching objectives andthe supported graduation requirements**

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1:Through the course study, become familiar with construction methods, technical principles, and processes, and be able to apply basic theories to solve complex engineering problems;

Course Objective 2:Master the means of literature retrieval and data consultation, be able to systematically analyze complex engineering problems in water engineering construction, and provide a basis for proposing effective solutions;

Course Objective 3:To be able to make reasonable selections of instruments and equipment used in water engineering, and to analyze and evaluate the impact of solutions to construction-related issues in water engineering on society, safety, and other factors.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4. Thematic Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by: Director Deng Jie (Office) Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Experimental Teaching of Water Quality Engineering

| | | | |
|---|---|---|---|
| Course | Water Quality Engineering Experiment | Course | 9021213140 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Name | | | | Number | | | | | |
| English name | Water supply engineering experiment | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective □ ) Concentrated Practice Course □ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 8 | practical study hours | 24 | Machine learning hours | 0 |
| Prerequisite courses | General Chemistry, Physical Chemistry, Water Analytical Chemistry, Water Treatment Biology, Water Quality Engineering | | | | | | | | |
| Textbooks and reference materials | Wu Junqi, chief editor. Water Treatment Experimental Technology(Third Edition). Beijing: China Architecture & Building Press,2009;<br>Laboratory self-compiled experimental guidebook "Water Quality Engineering Experiments." | | | | | | | | |

**CourseIntroduction**

《水质工程学实验》（Water supply engineering experiment）This course is a required course for the Water Supply and Drainage Science and Engineering major. Its purpose is to deepen students' understanding of the basic principles of water treatment technology and to cultivate their preliminary ability to design and organize water treatment experiment plans. It aims to develop students' general skills in conducting water treatment experiments and their basic ability to use experimental instruments and equipment; as well as to cultivate students' basic ability to analyze experimental data and process data.

**Course teaching objectives andthe supported graduation requirements**

1. Course Teaching Objectives

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

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

Course Objective 2:To enable students to master experimental methods and conclusions through experiments, acquire general skills in water treatment experiments and the use of equipment, develop the ability to solve technical problems in experiments, and broaden students' horizons.

Course Objective 3:Master the methods of designing experimental plans and organizing experiments, as well as measuring, analyzing, and processing experimental data, in order to draw practical conclusions. Cultivate students' academic ethics, stimulate their enthusiasm for learning, and establish the belief in serving the country.

(2) Teaching Methods

Pre-class self-study: watch videos on the online teaching platform, preview the experimental principles, and complete the tests.

Classroom collaborative inquiry: By combining virtual simulation experiments with actual experimental operations, using methods such as group experiments and focused discussions, personalized guidance is provided to help students complete experiments.

After-class consolidation and expansion: interactive Q&A on the online teaching platform, students complete discussion questions.

Drafted by: Li Haoxi (Department) Director Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Basic Teaching Outline for Hydraulic Engineering Equipment

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water engineering equipment foundation | | | | | Course Number | | 9021113150 | |
| English name | Elements of Water Technics and Equipment | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Courses£Disciplinary Foundation Courses£Core Major Courses (Elective£CompulsoryR) Independent Development Courses (Compulsory£Elective£) Concentrated Practice Courses£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Water QualityEngineering(1)、(2) and Building Water Supply and Drainage Engineering | | | | | | | | |
| Reference textbook | Huang TingLin“Water EngineeringEquipment Fundamentals”(Third Edition) ChinaConstruction Industry Press | | | | | | | | |

**CourseIntroduction**

Elements of Water Technics and Equipment is one of the main foundational courses for the Water Supply and Drainage Science and Engineering major. This course mainly introduces the types and characteristics of commonly used materials for water treatment equipment, the corrosion, protection, and insulation of materials and equipment, as well as the theoretical knowledge of the design and manufacturing processes of water treatment equipment. It discusses the types, working principles, and applicable conditions of common water treatment equipment. Through this course, students should acquire basic knowledge about commonly used materials for water treatment equipment and the corrosion, protection,

and insulation of materials and equipment, master the basic theories of water treatment equipment, and become familiar with the classification, forms, and working principles of specialized water treatment equipment, thereby initially developing the basic abilities for the development, design, selection, and operational management of water treatment equipment, laying a solid foundation for future work.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Through the course study,understand the operating principles and types of water treatment equipment, andmasterthe necessary water treatment technologies and the usage methods of information technology tools and their limitations.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulatedby:Wang AiheDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo



| | | | |
|---|---|---|---|
| Course | Water Supply and Drainage Engineering | Course | 9021113160 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Name | Instruments and Control | | | | Number | | | | |
| English name | Instrument and control of water supply and drainage engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation CourseRCore Major Course (Elective£CompulsoryR) Independent Development Course (Compulsory£Elective£) Intensive Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Water Quality Engineering、Electronic Engineering、Water Supply and Drainage Pipeline Network System | | | | | | | | |
| Teaching materials and resources | Course Materials:Cui Fuyi, Peng Yongzhen"Instrumentation and Control for Water Supply and Drainage Engineering" (Third Edition)[M].<br>Beijing:China Architecture & Building Press,2017 | | | | | | | | |

## 1. Course Introduction

Instrument and control of water supply and drainage engineeringI is a core course in the field of water supply and drainage science and engineering.

The instrumentation and control of water supply and drainage engineering organically combine water supply and drainage engineering with instrumentation automation, serving as an important tool for improving the automation, intelligence, and smart capabilities of water supply and drainage projects. This course teaches the necessary basic theories, knowledge, and skills related to instrumentation automation and its control in water supply science and engineering, cultivating students' logical thinking abilities, knowledge application abilities, and automated calculation design abilities. It equips them with the capability to apply instrumentation automation technology to solve operational management problems in water supply science and engineering, laying a foundation for subsequent courses and for engaging in related engineering technical work and scientific research. Through this course, students will acquire the foundational ability to read and design commonly used automation schemes in water supply science, initially develop the ability to communicate with related professionals and propose monitoring requirements for process systems, and gain a foundation in smart water management.

## 2. Course teaching objectives and the graduation requirements they support

### 1Course Teaching Objectives

Through this courselearning, students will acquire the following abilities:

Course Objective 1:Throughlearning the basic concepts of automatic control,the fundamental knowledge of detection technology, mastering the classification, principles, characteristics, and applicable conditions of major water supply and drainage automation instruments and

equipment,knowledge, mastering the control technology of pump speed regulation, constant pressure water supply systems, and the combined operation system of sewage pump stations,content, and the ability to solve the constant pressure water supply problem of pumps using variable frequency speed control technology.Mastering the system control technology of typical water supply treatment units and the application of PLC-based distributed control systems in water plants, initially possessing the ability to use automatic control technology to achieve efficient and economical operation of water supply treatment systems; students master the monitoring operation methods of sewage treatment plants, the process control of primary sewage treatment, the process control of secondary sewage treatment, and understand the ICA technology of sewage treatment systems, enabling students to initially possess the ability to apply automatic control technology to achievethe operation management of water supply and drainage systemtreatment equipment.Through the introduction of practical cases, cultivate students' engineering ethics, stimulate students' enthusiasm for learning, establish the belief of serving the country,and inspire students' professional identity.

(2) Teaching Methods

Emphasis on both classroom teaching and self-study.

The main focus is on classroom teaching, with some content primarily for self-study, while also arranging for Q&A and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3. Thematic Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by: Yuan Yueyang, Director of the Department Reviewed by: Wang Aihe Reviewed by: Li Yongsuo, College Leadership

# Engineering Surveying Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Engineering Surveying | | | | | Course Number | | 9024312821 | |
| English name | Engineering Surveying | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective□Required□) Independent Development Course (Required£ElectiveR) Intensive Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 2.0 | theoretical study hours | 28 | practical study hours | 4 | Machine learning hours | 0 |
| Prerequisite courses | Advanced Mathematics, Probability Theory and Mathematical Statistics, etc | | | | | | | | |
| Textbooks and reference materials | Textbook: "Engineering Surveying" (Third Edition) edited by Li Zhangshu, Chemical Industry Press.<br>References:Variousstandards, related textbooks, etc. | | | | | | | | |

## CourseIntroduction

《Engineering Surveying》（Engineering Surveying）is an independently developed course for the Water Supply and Drainage Science and Engineering major, and it is a course with strong practical application that combines theory and practice. The main content includes the basic knowledge, basic theories, and basic methods of engineering surveying; plane and elevation control surveying, topographic mapping, and the application of topographic maps, etc. Through theoretical study and practical training, it cultivates students' abilities in measurement, calculation, drawing, and using maps, equips them with certain capabilities in processing and analyzing measurement data, and familiarizes them with the workflow of engineering surveying; it fosters students' scientific spirit of seeking truth from facts and their work style of teamwork, perseverance, and hard work, laying a foundation for students to engage in engineering surveying, design, construction, management, and other work.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Understand the basic concepts of measurement, master the structural characteristics and usage methods of measuring instruments, be familiar with relevant engineering measurement standards, understand the calibration methods of measuring instruments, and be able to select appropriate modern measuring instruments and tools based on the construction environment and engineering characteristics when solving complex engineering measurement problems;

**Course Objectives2：** Master the methods for establishing measurement coordinate systems, conducting plane control and elevation control measurements, data processing, and topographic mapping, familiarize with topographic map styles, understand the basic knowledge of topographic maps and the fundamental principles of errors, possess the ability

to read and apply topographic maps, and initially develop the ability to analyze, reason, and solve engineering problems.

**Course Objectives3:**To have a rigorous and serious scientific attitude, a pragmatic work style, a hardworking labor attitude, and a collective concept of unity and cooperation; to be trained in organizational and practical work abilities, laying a foundation for future employment.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging forQ&Aand discussion after class.

2. Exercises

Each chapter includes corresponding exercises, includingfill-in-the-blankquestions,shortanswer questions and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Practical Operation

Master the structure, principles, and measurement methods of surveying instruments through operation..

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Formulated by:Cao YuanzhiDepartment (Office) Head Review:Zhou ZhongyuCollege Leadership Review: Li Yongsuo

# AutoCADBasic Teaching Outline

| | | | |
|---|---|---|---|
| Course Name | AutoCADBasics | Course Number | 9021324170 |
| English name | AutoCAD Foundation | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£ElectiveR) Concentrated Practice Course □ | | |
| | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 16 | credit | 0.5 | theoretical study hours | 0 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | Engineering drawing | | | | | | | | |
| Textbooks and reference materials | Course Textbook:“Water Supply and Drainage EngineeringCAD” edited by Zhao Mingxing, Machinery Industry Press<br>ReferenceMaterials:Design manuals, specifications, related textbooks, etc. | | | | | | | | |

**CourseIntroduction**

《AutoCAD Basics》（AutoCAD Foundation）This course is an elective for the Water Supply and Drainage Engineering major, and this syllabus is designed for students in the water supply and drainage field. Water supply and drainage CAD is based on the basic requirements of architectural drawing and the requirements of the water supply and drainage profession, utilizing various types of CAD software (including AutoCAD and Tianzheng Water Supply and Drainage CAD etc.), to cultivate the ability of students in the water supply and drainage major to proficiently use CAD software for water supply and drainage engineering drawing.

**Course teaching objectives andthe supported graduation requirements**

**1Course Teaching Objectives**

This course enables students to systematically learn and masterCADsoftware's basic operating methods, initially grasping the basic skills of usingCADto draw plumbing engineering diagrams, and cultivating students' basic ability to have an overall drawing approach for plumbing engineering diagrams. At the same time, it introduces the special requirements and professional standards in the field, integrating them together.

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

**Course Objectives1：** Proficiently applyAutoCADbasic drawing commands，masterAutoCADlayers, dimensions、 text annotations, and the concepts, definitions, and applications of blocks。

**Course Objectives2:**Master the drawing of plan and section views of water treatment structures, cultivate students' basic ability to have an overall drawing approach for water supply and drainage engineering graphics, and develop students' engineering literacy and rigorous drawing spirit.

**Course Objectives3:**Understand commonly usedCADsecondary development software and its application in engineering design within this major, broaden horizons, and cultivate awareness of self-directed learning and lifelong learning.

**(2) Teaching Methods**

1. Classroom Teaching:

(1) Change the traditional multimedia teaching method by using students' own laptops or conducting classes directly in the computer lab. First, the teacher demonstrates the basic operations of CAD software using multimedia equipment, followed by students practicing on their own. After the students finish practicing, the teacher can randomly select students to come up and demonstrate to understand their level of mastery;

(2) The case teaching method is adopted. For example, a single drawing of a certain process structure from the water supply and drainage standard atlas is assigned to students as a practical assignment. This assignment includes the use ofCAD for two-dimensional drawing and editing commands, as well as the requirements of industry drawing standards; in the subsequent teaching process, this drawing is broken down and integrated into the teaching of various chapters, allowing students to learn the specific applications of these commands in water supply and drainage engineering drawing while mastering the basic commands ofCAD; after the lecture, students are guided to integrate what they have learned to complete the practical assignment drawing.

2. Correct homework on time and promptly identify issues that arise during the teaching process.

3. Value after-school tutoring.

Drafted by: Director Li Haoxi Reviewed by: Wang Aihe Reviewed by: Li Yongsuo

# Teaching Syllabus for Basic Computer Applications in Water Supply and Drainage Engineering (includingBIMtechnology)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Basic Computer Applications in Water Supply and Drainage Engineering (includingBIMtechnology) | | | | | Course Number | | 9021324190 | |
| English name | Computer Application of Water Supply and Sewerage Engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course□Core Major Course (ElectiveCompulsory □ ) Independent Development Course (Compulsory£Elective£) Intensive Practice Course□ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 32 | credit | 1.0 | theoretical study hours | 8 | practical study hours | 0 | Machine learning hours | 24 |
| Prerequisite courses | Engineering drawing, hydraulics, pumps and pump stations,water supply and drainage pipeline systems,building water supply and drainage engineering | | | | | | | | |
| Textbooks and | Course Textbook: "Water Supply and Drainage Engineering CAD", Zhao | | | | | | | | |

| | |
|---|---|
| reference materials | Xingming, Machinery Industry Press, 2014.<br>Reference materials: design manuals, specifications, related textbooks, etc |

CourseIntroduction

The Basics of Computer Applications in Water Supply and Sewerage Engineering (includingBIM technology) (Computer Application of Water Supply and Sewerage Engineering) is one of the elective courses in the Water Supply and Drainage Science and Engineering major. The course is based on the basic requirements of architectural drawing and the requirements of the Water Supply and Drainage Science and Engineering major, introducing the most frequently used and widely applied auxiliary design software in this field —CAD, Tianzheng Architectural Software, Tianzheng Water Supply and Drainage Software, Hongye Municipal Pipeline (or Guanlide),BIM, and other software principles, features, and basic operation steps, cultivating students' ability to proficiently master and apply professional software for water supply and drainage engineering drawing.

Course teaching objectives andthe supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** UnderstandCAD、Tianzheng Architectural Software, Tianzheng Drainage Software, Hongye Municipal Pipeline (or Guanlide),BIMand other software installations, master the design of their working environment, basic operations, and be able to use the software for the design and drawing of professional blueprints, possess the ability to solve practical engineering problems, and establish a good professional ethics and sense of social responsibility.

**Course Objectives2:**Master the development of software related to the discipline of water supply and drainage science and engineering, integrate advanced drawing techniques into design, and possess the ability to adapt to social and technological developments.

**(2) Teaching Methods**

1. Classroom teaching andhands-on practice

The course covers the basic concepts of software, software design, key points of main operations, and includes operational demonstrations. Based on the teaching content and class schedule, necessary computer time will be arranged for practical exercises.

2. Exercises

Each chapter includes correspondingdrawing exercises to deepen understanding、master and apply the content taught in class, cultivating students' ability to operate independently and draw。

Formulated by:Deng YumeiDepartment (Office) Head Review::Wang AiheCollege Leadership Review: Li Yongsuo

# Syllabus for Engineering Project Management

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Project Management | | | | | Course Number | | 9041124010 | |
| English name | Construction Project Management | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£ElectiveR) Concentrated Practice Course□ | | | | | | | | |
| Course Offering Unit | ManagementCollege | | | | | | | | |
| Total study hours | 24 | credit | 1.5 | theoretical study hours | 24 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Foundation of civil engineering, water engineering constructionetc. | | | | | | | | |
| Textbooks and references<br>Data | Course Textbook: 《 Engineering Project Management 》 Tang YongChief Editor, ChinaElectric PowerPublishing House2016<br>References:Construction Project Management Standards, related textbooks, etc. | | | | | | | | |

## CourseIntroduction

《 Construction Project Management 》 （ Construction Project Management ） is anindependent development course (elective course) for the major ofWater Supply and Drainage Science and Engineering， aimed at guiding students to understand and master the basic knowledge and methodological system of managing engineering from the perspective of the owner, including organizational model construction, process decision-making, and management functions such as contracts, costs, schedules, quality, safety, and environment. It establishes awareness of the whole process of project management and a systematic mindset, clarifying the division of responsibilities and professional quality requirements corresponding to different management functions. The course emphasizes engineering as the object, combining engineering management theory with its application, stressing the use of facts as the basis for management decision-making, and understanding the inherent logic and advancement process of project management through collaborative thinking, effectively enhancing students' ability to solve practical engineering project management problems and forming a holistic, systematic management philosophy.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1 :** Through the course study, master the characteristics of the engineering types in this major, the organizational models of engineering, and the composition and operational rules of contracts, costs, schedules, quality, resources, safety, and

the environment. Understand the job settings and main responsibility objectives of different functions in engineering management for this major.

**Course Objectives2:**Based on the basic requirements of engineering project management standards, establish comprehensive process management, systematic management thinking, and understand the basic principles of multi-objective collaborative promotion in engineering management, fully fulfilling the social responsibilities of project management personnel in terms of public safety, health, and welfare.

**Course Objectives3:**Understand and master the methods and systems for achieving various functions of engineering management in this major, be able to use relevant basic data for systematic decision-making on various functions, and flexibly adopt a comprehensive approach from project planning and implementation to control and feedback.

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by: Liu SihuiDepartment (Office) Head Review:Liu SihuiCollege Leadership Review:Sun Qian

# Syllabus for Professional English Teaching

| | | | |
|---|---|---|---|
| Course Name | Professional English | Course Number | 9021113200 |
| English name | Professional English on Water Supply and Sewerage Engineering | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£ElectiveR) | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Concentrated Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 16 | credit | 1 | theoretical study hours | 16 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | College English (1), College English (2), College English Expansion Series Courses (1), College English Expansion Series Courses (2), Water Supply Engineering, Drainage Engineering, Building Water Supply and Drainage | | | | | | | | |
| Teaching materials and resources | Textbook: Edited by Wang Lichun, Mi Hairong, and others“Professional English for Water Supply and Drainage Engineering”[M].Harbin Engineering University Press<br>Reference materials: relevant standards, specifications, design manuals, etc | | | | | | | | |

Course Introduction

《 Professional English 》（ Professional English on Water Supply and Sewerage Engineering ）is an elective course for the water supply and drainage major. Through the teaching of this course, students will master a certain amount of professional vocabulary, terminology, and common English abbreviations; be able to read proficiently and correctly understand relevant English materials in this field to obtain scientific and technological information and professional knowledge; lay a foundation for future translation, reading professional articles, and consulting professional literature by reading various forms of professional English articles; become familiar with the characteristics of scientific and technological English, cultivate certain translation and writing skills to improve the practical application of English, and establish a good foundation for students to communicate and interact in cross-cultural and cross-professional contexts.

Course teaching objectives and the supported graduation requirements

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1:**To enable students to read English literature in their field, requiring students to master at least1500common vocabulary and idioms in their profession, cultivate students' professional qualities, and establish a good sense of professional ethics and social responsibility.

**Course Objectives2:**Understand and comprehend professional literature, while also possessing the ability to proficiently translate professional literature from English to Chinese and the preliminary ability to write professional papers in English, cultivate students' awareness of autonomous learning and lifelong learning, and establish national confidence and patriotism.

**Course Objectives3:**To cultivate studentswith a certain international perspective, capable of communicating and interacting in cross-cultural and cross-disciplinary contexts, and to establish a belief in serving the country.

(2) Teaching Methods

1.Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2.Translate

Each chapter's content is arranged with corresponding translations to deepen understanding and mastery of the material taught in class, fostering students' ability to think independently, analyze, and solve problems.

3.English Report

In conjunction with classroom teaching, organize corresponding themed groups for students to give English presentations, cultivating students' ability to communicate and express themselves in English.

Formulated by:Jiang HaiyanDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Water Supply and Drainage DesignStandards Interpretation and ApplicationTeaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Interpretation and Application of Water Supply and Drainage Design Standards | | | | Course Number | 9021824210 | | | |
| English name | Interpretation and application of water supply and drainage design specification | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (RequiredRElective£) Concentrated Practice Course □ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 16 | credit | 0.5 | theoretical study hours | 0 | practical study hours | 16 | Machine learning hours | 0 |
| Prerequisite courses | Water supply and drainage pipeline network system, water quality engineering, building water supply and drainage engineering | | | | | | | | |
| Textbooks and reference materials | None | | | | | | | | |

**CourseIntroduction**

《给排水设计规范解读与应用》（Interpretation and application of water supply and drainage design specification）is an independently developed course in the field of water supply and drainage science and engineering, primarily focusing on explaining the main reference specifications in the design process of water supply and drainage science and engineering. Through the interpretation of the specifications, students will master the main regulatory texts in water

supply and drainage design, gaining a comprehensive and systematic understanding of the basic methods and requirements for water supply and drainage engineering design, laying a necessary theoretical and practical foundation for future work in engineering design, scientific research, and operational management in this field. It aims to cultivate students' preliminary abilities in designing and calculating various structures and process systems in water quality engineering. This will establish a necessary theoretical and practical foundation for future work in water engineering design, scientific research, and operational management. It enhances the sense of mission and pride in the development of water supply and drainage engineering design in our country.

**Course teaching objectives andthe supported graduation requirements**

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1:Through the course study, understand the basic methods and requirements of water supply and drainage engineering design, laying a necessary theoretical and practical foundation for future work in engineering design, research, and operation management in this field.

Course Objective 2:Familiarize with the main design specifications related to water supply and drainage, and understand the maindesign specifications for engineering design requirements.

(2) Teaching Methods

1. Special Lecture

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Drafted by: Director Wang Aihe (Office) Review:Wang AiheCollege Leader Review: Li Yongsuo

# Syllabus for Water Engineering Operation and Management

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Engineering Operations andManagement | | | | Course Number | 9021824220 | | | |
| English name | Operation and Management of Water Engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (CompulsoryRElective£) Concentrated Practice Course£ | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 16 | credit | 0.5 | theoretical study hours | 16 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Water supply and drainage pipeline network system, water quality engineering, building water supply and drainage engineering, water engineering construction | | | | | | | | |
| Teaching materials and resources | Textbook: Chen Wei, Zhang Jinsong "Urban Water System Operation and Management" (Second Edition).<br>Beijing:China Architecture and Building Press,2010<br>References: relevant standards and specificationsregulations, design manuals, etc. | | | | | | | | |

**Course Introduction**

Operation and Management of Water Engineering is one of the important specialized courses for the major of Water Supply and Drainage Science and Engineering, mainly aimed at senior undergraduate students in this field. The main task of this course is to study the operation of urban water systems, including water resource utilization and protection, operation, maintenance, and management of water treatment plants, operation, maintenance, and management of sewage treatment plants, urban sewage treatment and recycling technology and management, operation and management of electrical and mechanical equipment in water treatment plants, operation, maintenance, and management of urban water supply networks, drainage networks, and pump stations, as well as enterprise operation management and financing of water supply and drainage projects. This enables students to master the basic processes of management and operation of water supply and sewage treatment plants, equipment maintenance, and financing. The course solidifies theoretical knowledge of water treatment through teaching methodologies, case analysis, in-class group discussions, and other teaching forms, cultivates practical abilities in water treatment operation management, and enhances their ability to analyze and solve complex problems in the operation management of water systems.

**Course teaching objectives and the supported graduation requirements**

1. Course Teaching Objectives

Through this courselearning, students will acquire the following abilities:

Course Objective 1:Through studying the operation and management system, content, objectives of urban water systems, and the relationship

between urban water resources and urban construction. The corresponding protection and management measures for urban water resource systems, with the basic ability to manage the operation of urban water intake structures. Learning the daily maintenance and operation management of water treatment plants, as well as the principles, management, and maintenance of various water treatment processes, can propose reasonable solutions to the abnormal issues present in each water treatment process, and possess the ability for the operation, maintenance, and management of water treatment. In practice, comprehensively consider the constraints of social, economic, health, safety, legal, cultural, and environmental factors.

Course Objective 2:By studying wastewater treatment processes and daily maintenance operation management, master the theoretical knowledge of different wastewater processes, and be able to propose reasonable solutions to the abnormal problems existing in various wastewater processes, as well as possess the ability for operation maintenance and management of wastewater treatment.Be able to analyze and evaluate the impact of engineering practices on environmental protection and sustainable development for complex engineering problems in this field.

Course Objective 3:Through the study of this chapter, students will master the basic knowledge of pipeline system operation management and drainage channel operation management, and specifically apply this knowledge to the technical management and maintenance of drainage networks. They will possess the ability to apply principles of water supply and drainage science and engineering management, as well as economic decision-making capabilities;

**(2) Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly based on classroom lectures, some contentrequires students to preview before class and review after class to consolidate, while also arranging for Q&A and discussions outside of class.

2. Exercises

This course is an engineering case course, and it is also an assessment course. No exercises are assigned for this course.

Drafted by: Director Zhou Junxi (Office) Reviewed by:Wang AiheCollege Leader Reviewed by: Li Yongsuo

# Teaching Syllabus for Electronic and Electrical Engineering Practice A

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Electronic Electrical TrainingA | | | | | Course Number | 9161715010 | | |
| English name | Electronic and Electrical Training A | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective□Required□) Independent Development Course (Required£Elective£) Intensive Practice Course | | | | | | | | |
| Course Offering Unit | Engineering Training Center | | | | | | | | |
| Total study hours | 1week | credit | 1.0 | theoretical study hours | 0 | practical study hours | 1week | Machine learning hours | 0 |
| Prerequisite courses | University Physics, Electrical and Electronic Technology | | | | | | | | |
| Teaching materials and resources | Course materials: Chen Caibiao, Zeng PinghongElectrical Engineering and Electronic Technology[M].Xian: Northwestern Polytechnical University Press,2018 | | | | | | | | |

## Course Introduction

Electronic and Electrical Engineering PracticeAis a concentrated practical course for the Water Supply Science and Engineering major. It includes two parts: electrical engineering practice and electronic practice. Electrical engineering practice is one of the practical teaching components for skill training of students in science and engineering majors. This course focuses on introducing applied knowledge in electrical engineering technology and cultivating students' hands-on abilities, playing a crucial role in enhancing students' ability to analyze and solve practical problems. The teaching objectives are: to enable students to master safety knowledge for electricity use, to familiarize students with the usage methods of common electrical tools, instruments, and meters, and to provide students with a preliminary understanding of basic electrical training, lighting circuit training, and power drive training, laying a solid foundation for students' future skills in electrical circuit design, application, engineering design capabilities, and scientific research abilities. Electronic practice is a technical foundation course that is practical and process-oriented, and it is one of the compulsory practical courses for science and engineering students. It is an important practical teaching component for cultivating high-quality, application-oriented talents in the new era. This course emphasizes practical teaching, focusing on improving students' ability to integrate theory and practice and their innovative capabilities, while also valuing the cultivation of engineering quality. The teaching objectives are: to enable students to correctly identify and test common electronic components, to understand and master the basic skills and knowledge of using common electronic instruments and meters; to grasp the basic knowledge and skills of soldering technology, and to acquire manual soldering skills for electronic circuit boards and printed circuit boards; through the assembly and debugging of electronic products, to understand the design process of electronic products. This lays a solid practical foundation for further study of professional courses and subsequent course design and graduation projects.

## Course teaching objectives and the supported graduation requirements

**1Course Teaching Objectives**

Through the practical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Master the common knowledge of safe electricity use and be proficient in using common electronic and electrical tools and instruments;Master various methods of connecting wires; master the installation methods of lighting fixtures, switches, and sockets; master the principles and practical operations of the starting control circuit, self-locking control circuit, and forward-reverse control circuit of three-phase asynchronous motors.

**Course Objectives2：** Master the basic functions, usage methods, and operational precautions of commonly used electronic instruments such as DC power supplies, function generators, digital storage oscilloscopes, and digital multimeters; learn to identify and test common electronic components; master the craft knowledge of manual soldering, including the use of flux and solder, as well as the quality of solder joints and influencing factors; master the correct usage methods of common welding and assembly tools; understand the production stages and debugging processes of electronic products.

**(2)Teaching Methods**

1. Equal emphasis on classroom teaching and self-study

Mainly classroom teaching, with some content focused on self-study, while arranging for questions and discussions outside of class.

2. Exercises

Each chapter includes corresponding exercises, including discussion questions, Q&A questions, and calculation problems, to deepen understanding and mastery of the content taught in class, and to cultivate students' ability to think independently, analyze, and solve problems.

3.Visit

In conjunction with classroom teaching, organize corresponding on-site visits to acquire necessary experiential knowledge.

4.Special Discussion

Conduct necessary thematic discussions based on the teaching content and class schedule to broaden learning perspectives and enhance the ability to analyze and solve problems.

Prepared by:Zeng Ying/Qiu BiaoDepartment (Office) Head Review::Zeng YingCollege Leadership Review::Jiang Dongchu

# Measurement Internship Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Measurement internship | | | | | Course Number | | 9024715800 | |
| English name | Surveying Practice | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2.0 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Engineering Surveying | | | | | | | | |
| Reference textbook | "Measurement Experiment Internship Guide" compiled by the Surveying and Mapping Teaching and Research Office of Hunan City University | | | | | | | | |

## 1. CourseIntroduction

Surveying Practice is an important practical teaching component for the undergraduate program in Water Supply and Drainage Science and Engineering. Through the practice, students can master the principles and methods of using common surveying instruments, information technology tools, engineering tools, and simulation software, and understand their limitations; they can complete work as individuals, team members, and leaders in a multidisciplinary team context.

## 2. Course Teaching Objectives andSupported Graduation Requirements

### 1Course Teaching Objectives

Through this course'spractices and internships, students will acquire the following abilities:

**Course Objectives1：** Understand the basic concepts of measurement, master the structural characteristics and usage methods of measuring instruments, be familiar with relevant engineering measurement standards, understand the calibration methods of measuring instruments, and be able to select appropriate modern measuring instruments and tools based on the construction environment and engineering characteristics when solving complex engineering measurement problems;

**Course Objectives2:**To have a rigorous and serious scientific attitude, a pragmatic work style, a hardworking labor attitude, and a collective concept of unity and cooperation; to be trained in organizational and practical work abilities, laying a foundation for future employment.

Formulated by:Wang PingDepartment (Office) Head Review:Zhou ZhongyuCollege Leadership Review:Li Yongsuo

# Introduction to Internship (1) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Understanding Internship (1) | | | | | Course Number | 9021615240 | | |
| English name | Cognition practice（1） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 1week | credit | 1 | theoretical study hours | 0 | practical study hours | 1week | Machine learning hours | 0 |
| Prerequisite courses | Introduction to Water Supply and Drainage Science and Engineering, Hydraulics, Pumps and Pump Stations, Water Treatment Microbiology, Water Analytical Chemistry | | | | | | | | |
| Reference textbook | "Water Supply Engineering," "Water Pollution Control Engineering," "Building Water Supply and Drainage Engineering," "Pumps and Pump Stations," etc | | | | | | | | |

## 1. CourseIntroduction

"Cognition practice (1)" (Cognition practice(1)) is an important practical component of the undergraduate study in the Water Supply and Drainage Science and Engineering major. Through this practice, students gain a preliminary understanding of water supply and drainage engineering, enhance their awareness of its role and status in national economic and social development, strengthen their intuitive understanding, and stabilize their professional mindset. Through teaching visits, special lectures, and other means, students gain a basic understanding of water treatment plants, sewage treatment plants, and building water supply and drainage engineering. By connecting theory with practice, it cultivates students' practical abilities and lays a solid foundation for the professional knowledge they will soon encounter.

## 2. Course Teaching Objectives andSupported Graduation Requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Familiarize with the overall layout of urban water supply systems, the actual production process of water treatment plants, the building water supply and drainage fire demonstration system, the overall layout of urban sewage treatment plants, the types of various treatment structures (facilities), their operational status, and maintenance management methods. Develop a good understanding of the humanities and social sciences, a strong sense of social responsibility, and the ability to understand and adhere to engineering ethics and standards in engineering practice within this field.

**Course Objectives2:**Be able to take on the roles of individual, team member, and leader in a multidisciplinary team context.

**(2) Teaching Methods**

The main approach is to use on-site teaching, primarily through visits to water treatment plants, sewage treatment plants, and building water supply and drainage fire demonstration systems, along with explanations and Q&A from the leading teachers, and to arrange special lectures based on actual circumstances.The special lectures mainly address questions and knowledge expansion regarding new processes and technologies that were not fully recorded or understood during the internship.

Formulated by:Yan HengzhenDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Course Design Teaching Outline for Pumps and Pump Stations

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Pump and Pump Station Course Design | | | | Course Number | 9021415250 | | | |
| English name | Course Design of Pump and Pump station | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 1week | credit | 1 | theoretical study hours | 0 | practical study hours | 1week | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics,Pumps and Pump Stations, Engineering Drawing | | | | | | | | |
| Teaching materials and resources | Course Materials:Zhang Wei, Zhou ShukaiPumps and Pump Stations[M].Beijing: Peking University Press,2014<br>References: relevant standards and specificationsregulations, design manuals, etc. | | | | | | | | |

**CourseIntroduction**

Course Design of Pump and Pump station is a concentrated practical teaching segment conducted after the core required course "Pump and Pump Station." The purpose of the course is to consolidate students' comprehensive application of the theoretical knowledge learned in "Pump and Pump Station," to reasonably utilize relevant standards, specifications, design manuals, computer-aided software, etc., to proficiently master the calculation methods and processes of pump station process design, to practice writing design specifications,

expressing drawings, and communication skills, and to cultivate the ability to combine theory with practice, analyze and solve engineering problems, laying a foundation for engaging in related work after graduation.

**Course teaching objectives and the supported graduation requirements**

**1Course Teaching Objectives**

Through this courselearning, students will acquire the following abilities:

**Course Objectives1：** Master the calculation methods and processes of pump station process design, and have the ability to solve practical engineering problems.

Course Objective 2:The ability to creatively propose new solutions, new technologies, and new materials while comprehensively considering constraints such as social, economic, and environmental factors in the preliminary design of pump station processes.

Course Objective 3:Master the writing format and depth requirements of design specifications, and master the drawing of engineering drawings, as well as the skills and methods for expressing results.

Drafted by Wang Caiwen, Director of the Department (Office) Reviewed by Wang Aihe, College Leadership Reviewed by Li Yongshuo

# Syllabus for the Course Design of Building Water Supply and Drainage

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Design of Building Water Supply and Drainage Engineering Course | | | | Course Number | | 9021415260 | | |
| English name | Course design of building water supply and drainage engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics,Pumps and pump stations, water analytical chemistry, etc. | | | | | | | | |
| | | | | | | | | | |

| | |
|---|---|
| Teaching materials and resources | Course textbook: Wang Zengchang. Building Water Supply and Drainage Engineering (7thEdition)[M], Beijing: China Architecture & Building Press, 2016.<br><br>Reference materials: relevant standards, specifications, codes, design manuals, etc. |

**CourseIntroduction**

“Course Design of Building Water Supply and Drainage Engineering”（Course design of building water supply and drainage engineering）is a practical teaching content that complements the study of the “Building Water Supply and Drainage Engineering” course, and is an important concentrated practical teaching link.The purpose of this course is to digest and consolidate the basic theories and knowledge of the “Building Water Supply and Drainage Engineering” course, to initially 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, improve students' design calculation skills and the ability to write design specifications, and lay a foundation for learning related practical links and engaging in related work after graduation.The task is to further familiarize students with the scheme design of various systems in building water supply and drainage engineering, master the principles and methods of design calculation in building water supply and drainage engineering, and cultivate and improve students' design and drawing skills.

**Course teaching objectives and the supported graduation requirements**

1. Course Teaching Objectives

Through this courselearning, students will acquire the following abilities:

Course Objective 1:Master the design calculation methods and processes of building water supply systems, drainage systems, and fire protection systems, possess the ability to solve practical engineering problems, and establish a good professional ethics and sense of social responsibility.

Course Objective 2:The ability to creatively propose new solutions, new technologies, and new materials while comprehensively considering constraints such as social, economic, and environmental factors in the design of building water supply and drainage systems. Cultivate students' engineering ethics, stimulate students' enthusiasm for learning, and establish the belief in serving the country.

Course Objective 3:Master the writing format and depth requirements of design specifications, as well as the drawing of engineering drawings and the skills and methods for expressing results. Broaden students' horizons, utilize the introduction of professional engineering to cultivate students' engineering ethics, stimulate students' enthusiasm for learning, and establish the belief in serving the country.

Formulated by:Deng Jie/Wang AiheDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongshuo

# Teaching Outline for Water Supply Pipeline Network Course Design

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Supply Pipeline Network Course Design | | | | Course Number | 9021415270 | | | |
| English name | Course Design of Water Supply Pipe System | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics,Pumps and Pump Stations,Water Supply and Drainage Pipeline System (1) | | | | | | | | |
| Teaching materials and resources | Course Textbook:Yan Xushi, Gao Naiyun“Water Supply Engineering (Volume 1)”[M].Beijing:Construction Industry Press,2020<br>References: relevant standards and specificationsregulations, design manuals, etc. | | | | | | | | |

**Course DesignIntroduction**

《 Course Design of Water Supply Pipe System 》（ Course Design of WaterSupplyPipeSysterm ） This course is a concentrated practical teaching segment following the core required course "Water Supply and Drainage Pipeline Network System (1）". The purpose of the course is to train students to comprehensively apply the theoretical knowledge learned in "Water Supply and Drainage Pipeline Network System (1） ””, to reasonably utilize relevant standards, specifications, design manuals, computer-aided software, etc., to proficiently master the planning and design calculation methods and processes of urban water supply pipeline systems, to practice writing design specifications, expressing drawings, and communication skills, and to cultivate the ability to combine theory with practice, analyze and solve engineering problems, laying a foundation for engaging in related work after graduation.

**Course teaching objectives and the supported graduation requirements**

**1Course Teaching Objectives**

Through this courselearning, students will acquire the following abilities:

Course Objective 1:Master the planning and design calculation methods and processes of urban water supply pipeline network systems, and have the

ability to solve practical engineering problems.

Course Objective 2:The ability to creatively propose new solutions, new technologies, and new materials while comprehensively considering constraints such as social, economic, and environmental factors in the design of water supply pipeline systems.

Course Objective 3:Masterthe writing format and depth requirements of design specifications, and master the drawing of engineering drawings, as well as the skills and methods for expressing results.

Drafted by: Wang Caiwen, Department (Office) Director Reviewed by: Wang Aihe, College Leadership Reviewed by: Li Yongsuo

# Syllabus for the Course Design of Drainage Pipe Network

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Drainage Pipe Network Course Design | | | | Course Number | | 9031415280 | | |
| English name | Course Project of Drainage Pipe System | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course□Core Major Course (Elective□Required□) Independent Development Course (Required£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Engineering drawing, water supply and drainage pipeline network system (2),AutoCAD fundamentals, basic computer applications in water supply and drainage engineering etc. | | | | | | | | |
| Textbooks and reference materials | Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## CourseIntroduction

《排水管网课程设计》（Course Project of Drainage Pipe System）This course is a concentrated practical teaching segment following the core required course "Water Supply and Drainage Pipe Network System (2)." The purpose of the course is to consolidate students' comprehensive application of the theoretical knowledge learned in "Water Supply and Drainage Pipe Network System (2)," to reasonably utilize relevant standards, specifications, design manuals, computer-aided software, etc., to proficiently master the design calculation methods and processes of drainage pipe network systems, to practice writing design specifications, expressing drawings, and communication skills, and to cultivate the ability to combine theory with practice, analyze and solve engineering problems, laying a foundation for engaging in related work after graduation.

## Course teaching objectives andthe supported graduation requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Master the design calculation methods and processes of urban sewage pipeline systems and rainwater drainage systems, possess the ability to solve practical engineering problems, and establish a good professional ethics and sense of social responsibility.

**Course Objectives2:**The ability to creatively propose new solutions, new technologies, and new materials while comprehensively considering constraints such as social, economic, and environmental factors in the design of urban drainage pipeline systems. Cultivate students' engineering ethics, stimulate their enthusiasm for learning, and instill a belief in serving the country.

**Course Objectives3:**Master the writing format and depth requirements of design specifications, and master the drawing of engineering drawings, as well as the skills and methods for expressing results.

Formulated by:Yan HengzhenDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Understanding Internship (2) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Understanding Internship (2） | | | | | Course Number | 9021615290 | | |
| English name | Cognition practice（2） | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 1week | credit | 1.0 | theoretical study hours | 0 | practical study hours | 1week | Machine learning hours | 0 |
| Prerequisite courses | Water Quality Engineering (1), Water Quality Engineering (2), Water Engineering Construction, Water Process Equipment Basics, Water Engineering Economics and Budgeting | | | | | | | | |
| Reference textbook | "Water Supply Engineering," "Water Pollution Control Engineering," "Water Engineering Construction," "Water Process Equipment Basics," "Water Engineering Economics and Budgeting" | | | | | | | | |

## 1. CourseIntroduction

"Cognition practice (2)" (Cognition practice(2)) is an important practical component of the undergraduate study in the Water Supply and Drainage Science and Engineering major. Through cognition practice, students gain an in-depth understanding and mastery of water

supply and drainage engineering, enhancing their awareness of the role and status of water supply and drainage engineering in national economic and social development, strengthening their intuitive understanding, and stabilizing their professional mindset. Through teaching visits, special lectures, and other means, students deeply grasp the layout of various pipelines in buildings, the internal water supply, drainage, fire protection systems, the basic processes of water treatment technology, and the forms and characteristics of structures, comprehensively understanding the main content of planning, design, construction, and management of water supply and drainage engineering, as well as the engineering construction procedures and management processes. By linking theory with practice, the knowledge learned is better and more fully integrated with engineering practice.

## 2. Course Teaching Objectives andSupported Graduation Requirements

### 1Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Familiarize with the overall layout, elevation arrangement, and actual production process of urban water supply systems; understand the overall layout, elevation arrangement, and types, operational status, and maintenance management methods of various treatment structures (facilities) in urban sewage treatment plants; be familiar with the basic components and layout requirements of internal water supply, drainage, and fire protection systems in buildings, as well as related equipment; possess a good cultural and social science literacy and a strong sense of social responsibility; and be able to understand and adhere to engineering ethics and standards in engineering practice within this field.

**Course Objectives2:**Be able to take on the roles of individual, team member, and leader in a multidisciplinary team context.

### (2) Teaching Methods

The main approach is to use on-site teaching, primarily through field visits to water treatment plants, sewage treatment plants, and building water supply, drainage, and fire protection systems, along with on-site explanations and Q&A by the leading teachers, and to arrange special lectures based on actual conditions. The special lectures mainly address questions and knowledge expansion regarding new processes and technologies that were not fully recorded or understood during the internship.

Formulated by:Deng JieDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Teaching syllabus for water treatment course design (including practical training in water supply plant engineering)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Water Treatment Course Design (Including Practical Training in Water Supply Plant Engineering) | | | Course Number | 9021415300 | | | | |
| English name | Design of Water Treatment Plant | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ RequiredR) Independent Development Course (Required£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2.0 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, pumps and pump stations, water analytical chemistry 、 water quality engineering（1）等 | | | | | | | | |
| Textbooks and reference materials | Textbook: "Architectural Water Supply and Drainage Engineering" (7th Edition) edited by Wang Zengchang, China Architecture & Building Press.<br>Reference materials: design manuals, specifications, related textbooks, etc | | | | | | | | |

## Course Introduction

“Design of Water Treatment Plant (including practical training in water supply plant engineering)”Design of Water Treatment Plant is the course design for the course "Water Quality Engineering I" in the major of Water Supply and Drainage Science and Engineering. The purpose of this course is to digest and consolidate the basic theories and knowledge of "Water Quality Engineering I", to initially 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, improve students' design calculation skills and the ability to write design specifications, and lay a foundation for learning related design practice and engaging in related work after graduation.

## Course teaching objectives

**1Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** Master the relevant design specifications for water supply and drainage, and be able to design reasonable solutions for complex engineering problems such as urban water supply plants;

**Course Objectives2:**Understand the general process of water treatment plant design, master the skills of design calculations and the methods of writing design documents, master

the skills and methods of drawing engineering drawings, and be able to clearly express personal design ideas and viewpoints.

Drafted by: Zhang Chun/Director of Li Yuanping's Department Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Wastewater TreatmentCourse Design(Including Practical Training in Wastewater Treatment Plant Engineering) Teaching Syllabus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Sewage Treatment Course Design (Including Practical Training in Sewage Plant Engineering) | | | | Course Number | 9021415310 | | | |
| English name | Course Design of Sewage Treatment (including Engineering Practice Ability Training of Sewage Treatment Plant) | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | Hydraulics, pumps and pump stations, engineering drawing, water quality engineering(2) | | | | | | | | |
| Teaching materials and resources | Course Textbook: Gao Tingyao, Gu Guowei, Zhou Qi. Water Pollution Control Engineering(Fourth Edition, Volume 2)[M].Beijing: Higher Education Press,2015<br>Reference materials: relevant standards, specifications, design manuals, and textbooks, etc | | | | | | | | |

**Introduction to Course Design**

《Course Design of Sewage Treatment (including Engineering Practice Ability Training of Sewage Treatment Plant） This course is a core required course following the course "Water Quality Engineering(2)." The purpose of the course is to consolidate students' understanding of the theoretical knowledge learned in "Water Quality Engineering(2)," and to apply it comprehensively in practical engineering. During the course design process, students need to analyze the original data and design requirements in the design task book, combine professional theoretical knowledge, and reasonably utilize relevant standards, specifications, design manuals, computer-aided software, etc., to propose effective and reasonable design solutions for the complex issues of urban and rural water engineering, design a water treatment system process flow that meets specific needs, and reflect innovative awareness in the design phase. They should consider factors such as society, health, safety, law, culture, and

environment, determine the treatment process flow, and complete the design calculations of treatment structures in accordance with industry standards, as well as complete the drawing preparation. Through the study and practice of this course, students will master the relevant processes of sewage treatment process design, improve their skills in writing design specifications, expressing drawings, and communication, and cultivate their ability to combine theory with practice, analyze and solve engineering problems, laying a foundation for engaging in related work after graduation.

**Course teaching objectives and the supported graduation requirements**

1. Course Teaching Objectives

Through this course, students will acquire the following abilities:

Course Objective 1:Masterwastewater treatmentprocess design's calculation methods and processes, possess the ability to solve engineeringpractical problems, and establish a good sense of professional ethics and social responsibility.

Course Objective 2:Ability to creatively propose preliminary solutions such as new schemes, new technologies, and new materials by comprehensively considering constraints like social, economic, and environmental factors.Wastewater treatmentprocess design.Foster students' engineering ethics and morals, stimulate students' enthusiasm for learning, and establish the belief of serving the country and the people.

Formulated by:Yan HengzhenDepartment (Office) Head Review:Wang AiheCollege Leadership Review:Li Yongsuo

# Production Internship Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Production internship | | | | | Course Number | 9021615320 | | |
| English name | Production Practice | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 14weeks | credit | 9.0 | theoretical study hours | 0 | practical study hours | 14weeks | Machine learning hours | 0 |

| | |
|---|---|
| Prerequisite courses | Pumps and pump stations, water supply and drainage pipe network systems, water quality engineering, building water supply and drainage, water engineering construction, etc |
| Textbooks and reference materials | |

**Course Introduction**

Production Practice （ Production Practice ） is an important practical course required for the major of Water Supply and Drainage Science and Engineering. The purpose is to deepen and consolidate the theoretical knowledge learned by students through production practice, based on mastering the basic knowledge and some specialized knowledge of the Water Supply and Drainage Science and Engineering major, expand the scope of professional knowledge, and improve practical operation skills. Through visits and production practice, students will learn and master the design characteristics, process flow, main design parameters, selection criteria and advantages and disadvantages of various structures, existing problems during operation, and improvement measures of water treatment plants and sewage treatment plants. By learning construction technology and basic operations of construction organization and production management, students will understand and master the design methods and construction methods of building water supply and drainage projects and municipal drainage pipeline projects. The production practice serves as a bridge between theory and engineering practice for students, allowing them to initially engage with society, enhance their communication skills, develop autonomous learning and practical innovation abilities, and lay a foundation for subsequent comprehensive training for graduation and entering the workforce.

**Course teaching objectives and the supported graduation requirements**

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1:To be able to meet the requirements of production internship tasks and gain certaindesign characteristics, process flows, main design parameters, selection criteria and advantages and disadvantages of various structures, existing problems and improvement measures, construction skills, etc. production experience in the areas of water supply plants, sewage treatment plants, building water supply and drainage engineering, and municipal drainage pipeline engineering, strengthen responsibility, and cultivate the professional ethics of water supply and drainage engineers, and establish the belief of serving the country.

Course Objective 2:Be able to select appropriate methods to solve problems encountered in engineering practice, and master the trends and dynamics of the discipline of water supply and drainage science and engineering in engineering practice.Possess the ability to communicate effectively and adapt to social and technological developments.

Course Objective 3:Be able to write production internship practice reports in a standardized manner and accurately and effectively express professional insights through presentations, speeches, and defenses.

(2)Teaching Methods

1 . Students and teachers should jointly contact the internship unit,requiring students to complete the internship content in only one direction, although they may also engage in multiple directions based on actual circumstances, but the internship duration for each direction must not be less than 6 weeks.

Each student needs to have one off-campus internship supervisor with an intermediate title or above and one on-campus supervisor. Daily fill out the internship content, internship summary, and attendance sheet.

Prepared by: Li Yuanping, Director of the Department, Reviewed by:Wang AiheCollege Leader Reviewed: Li Yongsuo

# Metalworking Internship Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | MetalworkingInternship | | | | | Course Number | 9021715330 | | |
| English name | Metalworking Practice | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 2weeks | credit | 2.0 | theoretical study hours | 0 | practical study hours | 2weeks | Machine learning hours | 0 |
| Prerequisite courses | ArchitectureWater Supply and Drainage Engineering、Water Supply and Drainage Pipeline Network System、Water Quality Engineering etc. | | | | | | | | |
| Textbooks and reference materials | | | | | | | | | |

**CourseIntroduction**

《Metalworking Practice》（Metalworking Practice）is part of the practical teaching segment，and the following objectives are achieved through this training：

1. Understand the characteristics and application fields of various types of pipes in pipeline engineering through this training, recognize the shapes and structures of various fittings, master their roles and functions, and become familiar with the connection methods of various pipes and fittings;

2. Understand various pipeline accessories and the composition, structure, and basic installation methods of pumps, master the usage of dry powder fire extinguishers, further cultivate students' basic operational skills based on professional theoretical teaching, and help students improve their application abilities in building pipeline engineering;

3. Through observation, inquiry, analysis, and discussion during training, cultivate students' initiative and enthusiasm for work and study, and develop their ability to comprehensively analyze problems and solve practical engineering issues.

Course teaching objectives andthe supported graduation requirements

**1.Course Teaching Objectives**

Through the theoretical teaching and training of this course, students will acquire the following abilities:

**Course Objectives1：** During the practical process, be able to take on the roles of individual, team member, and leader;

Course Objective 2:Be able to write an internship report according to the specific content of the training, clearly express personal views, and possess basic engineering communication and interaction skills.

Formulated by:Deng YumeiDepartment (Office) Head Review:Wang AiheCollege Leadership Review: Li Yongsuo

# Graduation Internship Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Graduation internship | | | | Course Number | 9021615340 | | | |
| English name | GraduationPractice | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course£Core Major Course (Elective£Compulsory£) Independent Development Course (Compulsory£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study | 2weeks | credit | 2 | theoretical | 0 | practical | 2weeks | Machine | 0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| hours | | | | study hours | | study hours | | learning hours | |

| | |
|---|---|
| Prerequisite courses | Pumps and pump stations, water supply and drainage pipeline systems, water quality engineering, building water supply and drainage, civil engineering foundations |
| Teaching materials and resources | |

**ProjectIntroduction**

“Graduation Practice”GraduationPractice is one of the important practical teaching components for the Water Supply and Drainage Engineering major. Its purpose is to enable students to become more familiar with and master professional knowledge through concentrated practical teaching activities before their graduation design, to consolidate and enrich the content of the professional courses they have learned, to understand the working principles, process design, and calculations of various systems in municipal water supply and drainage and building water supply and drainage projects, to understand the engineering design process and the design depth and requirements at each design stage, and to cultivate students' ability to comprehensively apply engineering knowledge and professional knowledge to solve practical engineering problems.

**Course teaching objectives and the supported graduation requirements**

**1Course Teaching Objectives**

Through this courselearning, students will acquire the following abilities:

**Course Objectives1：** To be able to write a standardized graduation internship report, to proficiently express personal views clearly through text and drawings, and to effectively communicate and exchange ideas with industry peers regarding one's own viewpoints and thoughts, cultivating students' professional qualities and establishing a good sense of professional ethics and social responsibility.

Course Objective 2:To cultivate students' ability to acquire the latest technological frontiers in water supply and drainage science and engineering, engineering technology, and engineering management through independent learning methods such as literature search and academic communication, to develop a continuous learning and adaptability capability, and to establish a belief in serving the country.

(2) Teaching Methods

The main approach is to use on-site teaching, primarily through explanations and Q&A by the production, management, and supervising teachers at the internship unit (or location). Depending on the actual situation, discussion sessions or Q&A sessions can be arranged. The special lectures mainly address questions and knowledge expansion regarding new processes and technologies that were not fully recorded or understood during the graduation internship process.

Drafted by: Jiang Haiyan, Department Head Reviewed by: Wang Aihe Reviewed by: Li Yongsuo

# Graduation Comprehensive Training Teaching Outline

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Course Name | Graduation Comprehensive Training | | | | Course Number | 9021515350 | | | |
| English name | Comprehensive training of Water Supply and Drainage Science & Engineering | | | | | | | | |
| Applicable majors | Water Supply and Drainage Science and Engineering | | | | | | | | |
| Course nature | General Education Course£Disciplinary Foundation Course □ Core Major Course (Elective □ Required □ ) Independent Development Course (Required£Elective£) Concentrated Practice CourseR | | | | | | | | |
| Course Offering Unit | School of Municipal and Surveying Engineering | | | | | | | | |
| Total study hours | 13weeks | credit | 13.0 | theoretical study hours | 0 | practical study hours | 0 | Machine learning hours | 0 |
| Prerequisite courses | Pumps and pump stations, water supply and drainage pipeline systems, water quality engineering, building water supply and drainage engineering, etc | | | | | | | | |
| Textbooks and reference materials | | | | | | | | | |

**CourseIntroduction**

Graduation ComprehensiveTraining is a core course for the major of Water Supply and Drainage Science and Engineering, and it is the last practical teaching link for students during their studies. Through the selection of topics, literature review and usage plans, optimization calculation writing, drawing preparation, and defense in the Graduation ComprehensiveTraining, students are trained to comprehensively apply their knowledge to analyze and solve problems in water supply and drainage engineering.

**Course teaching objectives andthe supported graduation requirements**

1. Course Teaching Objectives

Through the theoretical teaching and training of this course, students will acquire the following abilities:

Course Objective 1: Be able to develop a reasonable design plan based on the requirements of the graduation design task, considering and evaluating the impact of the design on society, health, safety, law,

culture, and the environment, propose solutions, demonstrate the rationality of the solutions, and optimize the design plan.

Course Objective 2: Able to select appropriate tools to perform relevant design calculations for design projects and write design calculation reports and drawings, as well as analyze and judge the results of the design calculations; or conduct research on topics and draw certain conclusions from the research. Able to accurately and effectively express professional insights through presentations, defenses, and other means.

Course Objective 3:Master the trends and dynamics of water supply and drainage science and engineering disciplines, integrate advanced technologies into design, and possess the ability to adapt to social and technological developments.

Formulated by: Zhang Chunxi (Office) Director Review:Wang AiheCollege Leader Review: Li Yongsuo