Catalog

Ideology, morality and the rule of law

Module Name	Ideology, morality and the rule of law		
The semester in which this module is taught	Semester 1		
Module Leader	Li Yifan		
language	Chinese		
Relationship to the curriculum	General education is a compulsory course		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: The cloud class platform completes after-class homework and video resource learning Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 75 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1 hour and 16 minutes per week, a total of 18 weeks, 21 hours, including: after-class homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the main content of the outlook on life and establish a correct outlook on life; the connotation and importance of ideals and beliefs; Correctly understand the relationship between ideals and reality, personal ideals and social ideals, master the principle of unity between personal ideals and social ideals, and understand the basic requirements for establishing lofty ideals and realizing ideals. deeply understand the basic connotation of the Chinese spirit, national spirit and patriotism, and understand the patriotism in the new era; The scientific connotation and	R6

		significance of socialist core values are significant.	
	CLO2	master and speak of the essence and function of morality, the core and principles of socialist morality, and understand the basic connotation of traditional Chinese virtues and Chinese revolutionary morality; establish a correct moral outlook, consciously inherit traditional Chinese virtues and Chinese revolutionary morality, and continuously improve moral quality in the practice of advocating morality and goodness; Understand the meaning of morality, achieve great morality, abide by public morality, strictly enforce private morality, and temper moral character.	R7
	CLO3	Understand and speak of the socialist legal system, the rule of law system and the rule of law path, the rule of law thinking, and the basic content and connotation of legal rights and obligations; Internalize the respect for the rule of law in the heart, externalize exemplary compliance with the law in practice, improve the quality of the rule of law, and become the backbone of the construction of the rule of law in China. Improve legal literacy, cultivate rule of law thinking, respect and maintain legal authority, and exercise power and perform obligations in accordance with the law.	R8
content	Through the study of this course, students master the basic knowledge and theories of outlook on life, values, morality and the rule of law; Possess basic ability to analyze and solve problems; Continuously improve their ideological and moral quality and rule of law literacy, and grow into a new person of the era who consciously shoulders the great task of national rejuvenation. Course Introduction: (Weight 2/54, Level: Memory + Comprehension + Analysis). Chapter 1: Comprehend the true meaning of life and grasp the direction of life (weight: 6/54, level: memory + understanding + analysis). Chapter 2: Pursuing lofty ideals and strengthening lofty beliefs (weight: 6/54, level: memory + understanding + analysis). Chapter 3: Inheriting the Fine Traditions and Promoting the Chinese Spirit (Weight: 12/54, Level: Memory + Understanding + Analysis). Chapter 4: Clarify the pursuit of values and practice the value code (weight: 8/54, level: memory + understanding + analysis). Chapter 5: Comply with moral norms Temper moral character (weight:		

	12/54, level: memory + understanding + analysis). Chapter 6: Learning the Idea of the Rule of Law and Improving the Rule of Law Literacy (Weight: 8/54, Level: Memory + Understanding + Analysis).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	(1) Recommended textbook "Ideology, Morality and the Rule of Law", editor-in-chief of the writing team, Higher Education Press, February 2023. (2) References [1] Political Science and Life, by Ruskin, translated by Lin Zhen, Renmin College Press, 2014 edition. [2] "On the Spirit of Law", by Montesquieu, translated by Zhang Yanshen, Commercial Press, 2012 edition. [3] Walden, by Thoreau, translated by Li Jihong, Tianjin People's Publishing House, 2018 edition. [4] "1984", written by Orwell, translated by Fu Xia, Times Literature and Art Publishing House, 2018 edition. [5] "Xi Jinping's Seven Years of Educated Youth", Party School Publishing House of the Central Committee of the Communist Party of China, 2017 edition. [6] Excerpts from Xi Jinping's Exposition on the Overall National Security Concept, Central Literature Publishing House, 2018 edition. [7] "On Adhering to the Comprehensive Rule of Law", Central Literature Publishing House, 2020 edition. [8] Xi Jinping on Governing the Country, Volume 3, China Foreign Languages Publishing House, 2020 edition. [9] "Compilation of Documents of the 20th National Congress of the Communist Party of China", Party Building Books Publishing House, 2022 edition. [10] "100 Questions on Study and Counseling of the 20th National Congress of the Communist Party of China", Party Building Reading Publishing House, 2022 edition.

	[11] "Special Excerpts from Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era", Party Building Reading Publishing House, 2024 edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Socialism with Chinese Characteristics for a New Era

Module Name	Socialism with Chinese Characteristics for a New Era		
The semester in which this module is taught	Semester 1		
Module Leader	Li Yayuan		
language	Chinese		
Relationship to the curriculum	General education is a compulsory course		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: complete after-school homework and video resource learning on the cloud class platform; Practical method: practical teaching.		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 75 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.2 hours per week, a total of 18 weeks, 21 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Be able to speak of the latest theoretical achievements of the Sinicization of Marxism, and fully understand the historical background, development process, scientific system, historical status, and guiding significance of the new leap of Marxism in the Sinicization of the times. Be able to elaborate on the general task of upholding and developing socialism with Chinese characteristics, know the strategic arrangements for building a modern socialist country in an all-round way, and	R6

	know the lines, principles and policies of socialist modernization with Chinese characteristics in the new era. Learn the relevant content of Chinese-style modernization to comprehensively promote the great rejuvenation of the Chinese nation, and understand that Chinese-style modernization is the only correct way to build a strong country and rejuvenate the nation. Understand that the leadership of the Communist Party of China is the most essential feature of socialism with Chinese characteristics, and agree that adhering to the party's overall leadership is the only way to uphold and develop socialism with Chinese characteristics. Experience the fundamental position of being people-centered, and establish the lofty ideal of serving the people and striving for the socialist cause.	
CLO2	Be able to expound the main content of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, say the overall layout of the "five-in-one" and the "four comprehensive" strategic layout, master the strategic support for realizing socialist modernization, understand the country's major policies, and know what the national development strategy is and why. Comprehensively understand the theoretical character and ideological style of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, such as the supremacy of the people, lofty faith, historical consciousness, problem-oriented, fighting spirit, and feelings of the world, and enhance the political, theoretical, ideological and emotional identity of this thought.	R7
CLO3	I can list the important guarantees for realizing the great rejuvenation of the Chinese nation, deeply understand the great significance of adhering to "one country, two systems" and promoting the complete reunification of the motherland, know China's current diplomatic characteristics and international role, and have a deep understanding of the key to	R8

		comprehensively building a modern socialist country and comprehensively promoting the great rejuvenation of the Chinese nation in the new era. Those who can initially understand the basic principles behind the international situation and national policies, see the policy orientation and development purpose, work the unity of knowledge and action, apply what they have learned, and vigorously promote the fine academic style of linking theory with practice, can more consciously use this ideology to guide and solve practical problems.	
	CLO4	Carry out practical activities. Through online learning practice and on-site practical teaching inside and outside the school, the perception of vivid historical materials, the creation of specific historical or realistic scenarios, the deepening of the cognition of teaching content, the sense of history and the times, and the establishment of correct political direction, outlook on life and values; explore practical problems and solve the confusion of contemporary college students; It can arouse ideological shock and resonance, help form a simple sense of patriotism and love for the people and a sense of being prepared for danger in times of peace, and enhance its sense of historical mission, national self-esteem and sense of responsibility for life. Students can consciously integrate patriotism, national ambition, and service to the country into their study and practice, carry forward the fine academic style of linking theory with practice, and more consciously use Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era to guide and solve practical problems, and effectively transform theoretical learning into vivid practice of being a striver in the new era.	R12
content	"Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era" is the core course in the political theory course of ordinary colleges and universities across the country. The basic content of the course is to systematically discuss the scientific theoretical system of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, through the new leap of Marxism in		

	Sinicization, adhere to and develop the general task of socialism with Chinese characteristics, adhere to the party's overall leadership, adhere to the people-centered, lead high-quality development with the new development concept, comprehensively deepen reform, develop people's democracy in the whole process, comprehensively rule the country according to law, build a socialist cultural power, strengthen social construction focusing on people's livelihood, build socialist ecological civilization, To build the people's army into a world-class army in an all-round way, fully implement the overall national security concept, adhere to the "one country, two systems" and promote the reunification of the motherland, promote the construction of a community with a shared future for mankind, comprehensively and strictly govern the party, be a pioneer in the new journey, and strive to be a career leader, students can fully grasp and effectively apply this latest theoretical achievement of Marxism in Sinicization, and establish a correct world view, outlook on life and values. Students can consciously use Marxist positions, viewpoints and methods to improve their ability to analyze and solve practical problems in the process of building socialism with Chinese characteristics in the new era; Students can establish common ideals and beliefs in socialism with Chinese characteristics in the new era. Teaching content: Introduction (weight 3/54, level: memory + understanding + analysis). Chapter 1 Upholding and Developing Socialism with Chinese Characteristics in the New Era (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 2 Comprehensively promote the great rejuvenation of the Chinese nation with Chinese-style modernization (weight 3/54, level: memory + understanding + analysis). Chapter 3 Adhere to the party's overall leadership (weight 3/54, level: memory + understanding + analysis). Chapter 4 Adhere to the people-centered approach (weight 3/54, level: memory + understanding + analysis). Chapter 5 Comprehensively deepening reform (weight 3/54, level: memory + understanding + analysis). Chapter 6 Promote high-quality development (weight 3/54, level: memory + understanding + analysis). Chapter 7 Education, Science and Technology, and Talent Strategies for Socialist Modernization (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 8 Developing Whole-process People's Democracy (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 9 Comprehensive rule of law (weight 3/54, level: memory + understanding + analysis). Chapter 10 Building a Socialist Cultural Power (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 11 Strengthening social construction with a focus on protecting

	and improving people's livelihood (weight 3/54, level: memory + understanding + analysis). Chapter 12 Building a Socialist Ecological Civilization (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 13 Maintaining and Shaping National Security (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 14 Building and Consolidating National Defense and Strengthening the People's Army (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 15 Adhere to "one country, two systems" and promote the complete reunification of the motherland (weight 3/54, level: memory + understanding + analysis). Chapter 16 Major Power Diplomacy with Chinese Characteristics and Promoting the Construction of a Community with a Shared Future for Mankind (Weight 3/54, Level: Memory + Understanding + Analysis). Chapter 17 Comprehensively and strictly administering the party (weight 3/54, level: memory + understanding + analysis).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Process assessment, scored on a percentage scale, accounting for 40% of the total evaluation score, including classroom performance, independent learning, phased testing, practical teaching, etc. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era", Higher Education Press, People's Publishing House, August 2023 edition 2. Counseling Reader of the Report of the 20th National Congress of the Communist Party of China, People's Publishing House, October 2022 edition 3. The report of the 20th National Congress of the Communist Party of China, Learning Publishing House, Party Building Reading Publishing House, October 2022 edition
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Fundamentals of Marxism

Module Name	Fundamentals of Marxism		
The semester in which this module is taught	Semester 2		
Module Leader	Shen Shiqiang		
language	Chinese		
Relationship to the curriculum	General education courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 75 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Practical hours: 1.17 hours per week, a total of 18 weeks, 21 hours, including: after-class homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Ideology, morality and the rule of law, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	8.1 Have good morals, have a correct worldview, outlook on life and values, and understand the relationship between individuals and society;	R8、R12
content	This course is a course that systematically teaches the basic theories of Marxism, and organically integrates the three main components of Marxism: Marxist philosophy, political economy and scientific socialism. It aims to help students correctly understand the basic laws of human social development, correctly understand the historical process of capitalist development, establish a correct world view, outlook on life and values, cultivate and improve students' ability to use Marxist theory to analyze and solve practical problems, and strengthen the ideals and beliefs of striving for the great cause of		

	socialism with Chinese characteristics. The specific objectives are as follows: Course objective 1: Be able to explain the development laws of nature, thinking and human society, be able to use the basic Marxist views, positions and methods to understand and analyze various situations and problems faced by electrical engineering and its automation major, and guide students with positive, scientific and correct values, so as to help students establish a correct world view, outlook on life and values. Course objective 2: Be able to explain the basic methods of Marxism to understand and transform the world, use the basic views and methods of Marxism to analyze various problems and scenarios faced by electrical engineering and its automation, and be able to formulate realistic work plans according to different engineering situations faced to improve pertinence and effectiveness. Course objective 3: Be able to explain the world view and methodology of Marxist science, master the critical way of thinking, recognize the context and main line of world development through the relationship between the existence of the existing world and thinking, continuously improve their ability to understand the world, have the ability to think and reflect on different situations of electrical engineering and its automation, and constantly improve their logical thinking ability to adapt to the needs of different complex scenarios and situations. Teaching content: Introduction (Weight 2/54, Level: Memory) Chapter 1 The materiality of the world and its development law (weight 10/54, level: memory, understanding, evaluation, etc.) Chapter 2 Practice and Understanding and Its Development Law (Weight: 8/54, Level: Memory, Understanding, Evaluation) Chapter 3 Human Society and Its Development Laws (Weight: 14/54, Level: Memory, Understanding, Evaluation, Including Social Practice) Chapter 4 The Essence and Laws of Capitalism (Weight: 8/54, Level: Memory, Understanding) Chapter 5 The Development of Capitalism and Its Trends (Weight 4/54, Level: Memory, Understanding) Chapter 6 The Development of Socialism and Its Laws (Weight 6/54, Level: Memory, Understanding) Chapter 7 The Noble Ideals of Communism and Its Ultimate Realization (Weight 2/54, Level: Memory, Understanding)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting

	for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1 Marx: "Manuscript of the Philosophy of Economics of 1844", "Theses on Feuerbach", "Introduction to the Critique of Hegel's Philosophy of Law", "Capital", "Critique of the Gotha Program", "German Ideology". 2 Engels: "Speech at the Tomb of Marx", "Ludwig. Feuerbach and the End of German Classical Philosophy", "The Origin of the Family, Private Property and the State", "Anti-Dühring" Philosophy, and "Dialectics of Nature" related chapters. 3 Marx and Engels: "The Communist Manifesto", "Nine Correspondences on Historical Materialism" 4 Lenin: "Karl. Marx", "Friedrich Engels", "On Several Characteristics in the Historical Development of Marxism", "Three Sources and Three Components of Marxism", "Talking about Dialectics", "Elements of Dialectics". 5 Mao Zedong: "Caring for the lives of the masses and paying attention to working methods", "Theory of Practice", "Theory of Contradiction", "Where does people's correct thinking come from?" ", "Transform Our Learning", "Serve the People". 6 Stalin: "On the Foundations of Leninism", "On Dialectical Materialism and Historical Materialism". 7 Deng Xiaoping: "Emancipating the Mind, Seeking Truth from Facts, Looking Forward in Unity", "Building Socialism with Chinese Characteristics", "Relying on Ideals and Discipline to Unite", "Key Points of Conversation in Wuchang, Shenzhen, Zhuhai, Shanghai and Other Places". 8 Jiang Zemin, "On the 'Three Represents'", "Speech at the Conference to Celebrate the 80th Anniversary of the Founding of the Communist Party of China", "President Jiang Zemin's Speech at the United Nations Millennium Summit Breakout Session". 9 Hu Jintao: "Speech at the Seminar on the Important Ideology and Theory of the "Three Represents", "Unswervingly Advancing along the Road of Socialism with Chinese Characteristics and Striving to Build a Moderately Prosperous Society in an All-round Way - Report at the 18th National Congress of the Communist Party of China", "Speech at the Seminar on Improving the Ability of Major Leading Cadres at the Provincial and Ministerial Levels to Build a Socialist Harmonious Society". 10 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Propaganda Department of the Central Committee of the Communist Party of China, Learning Publishing House, People's

	Publishing House, June 2019 edition. 11 Thirty Lectures on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Propaganda Department of the Central Committee of the Communist Party of China, Learning Publishing House, May 2018 edition. 12 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, 2023 edition, Learning Publishing House and People's Publishing House, 2023 edition. 13 Selected Readings of Xi Jinping's Works, Volume 1, Volume 2, People's Publishing House, 2023 edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Outline of modern Chinese history

Module Name	Outline of modern Chinese history		
The semester in which this module is taught	Semester 2		
Module Leader	Thank you, Li Lei		
language	Chinese		
Relationship to the curriculum	General studies are compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, case analysis method; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical method: practical teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 75 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.2 hours per week, a total of 18 weeks, 21 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Ideology, morality and the rule of law, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Explain why the Opium War was the beginning of China's modern history, as well as foreign military aggression, economic plunder, political control and cultural enslavement of China after the Opium War, understand the peasant class, the landlord class ruling group, and the bourgeois reformists and revolutionaries in their exploration of the country's way out, and tell the reasons and lessons of failure. Understand the two historical tasks facing modern China: striving for national independence, people's liberation, and realizing national prosperity and modernization. Use Marxist historical materialism to solve China's	R8

	practical problems.	
CLO2	Tell the historical inevitability and importance of the founding of the Communist Party of China, and understand the theme and main line of Chinese history since the founding of the Communist Party of China. Understand the great historical significance of the founding of the People's Republic of China. Master the efforts and achievements of the Communist Party of China in exploring the path of socialist construction in China. Speak of the inevitability and necessity of the Communist Party of China in carrying out reform, opening up and socialist modernization. Deeply understand how history and the people chose Marxism, the Communist Party of China, the socialist road, and reform and opening up. Finally, it will promote college students to clarify their ideological misunderstandings and consciously resist the erroneous trend of historical nihilism.	R8
CLO3	Deeply grasp the overall impact and significance of the changes in the main social contradictions in the new era. Tell the theme and historical significance of the 20th National Congress of the Communist Party of China, and talk about the work of the past five years and the great changes in the new era and ten years. Adhere to Marxism-Leninism, Mao Zedong Thought, Deng Xiaoping Theory, the important thought of "three represents", and the scientific outlook on development, fully implement Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, use Marxist positions, viewpoints, and methods to observe, grasp, and lead the times, and continuously deepen our understanding of the laws of the Communist Party's governance, socialist construction, and the development of human society.	R8
CLO4	Through on-site teaching, the perception of vivid historical materials, the creation of specific historical or realistic scenarios, deepen students' cognition of teaching content, cultivate students'	R12

		sense of history and the times, and establish correct political directions, outlook on life and values. explore practical problems and solve the confusion of contemporary college students; It triggers its ideological shock and resonance, prompts it to form a simple sense of patriotism and love for the people and a sense of being prepared for danger in times of peace, and enhances its sense of historical mission, national self-esteem and sense of responsibility.	
content	Through this course, students will understand the deep suffering caused by foreign capital-imperialist aggression against China and its collusion with Chinese feudal forces to the Chinese nation and the Chinese people. understand the two historical tasks faced by China in modern times: striving for national independence, people's liberation, and achieving national prosperity and people's prosperity; understand the arduous exploration and tenacious struggle of China's advanced elements and the people in modern times for the survival of the country and their experiences and lessons; in connection with the domestic and foreign environment after the founding of New China, understand the historical inevitability of the Chinese people embarking on the socialist road led by the Communist Party; Deeply understand how history and the people chose Marxism, the Communist Party of China, the socialist road, and reform and opening up. Closely integrate with the historical reality of modern China, and improve the ability to analyze historical issues and distinguish right from wrong through the analysis of relevant historical processes, events and figures. By drawing on history, thinking about and exploring the historical and cultural connotation on which the Chinese nation relies to modernize, we should cultivate the psychological characteristics of a new national culture that is neither arrogant nor self-deprecating, and is both confident and humble. Teaching content: Introduction (weight 2/54, level: memory - evaluation). Chapter 1 enters the tribulations and struggles of the Chinese nation after modern times (weight 4/54, level: memory - evaluation). Chapter 2: Early exploration of the way out of the country by different social forces (weight 5/54, level: memory - evaluation). Chapter 3 The Xinhai Revolution and the End of the Absolute Monarchy (Weight 4/54, Rating: Memory - Evaluation). Chapter 4 The Founding of the Communist Party of China and the New Situation of the Chinese Revolution (Weight 6/54, Grade: Memory - Evaluation). Chapter 5 The New Path of the Chinese Revolution (weight 5/54, level: memory - evaluation). Chapter 6 The War of Resistance Against Japanese Aggression of the Chinese Nation (weight 7/54, level: memory - evaluation).		

	Chapter 7 Struggle for the Establishment of New China (Weight 6/54, Rating: Memory - Evaluation). Chapter 8 The Founding of the People's Republic of China and the Exploration of China's Socialist Construction Road (weight 5/54, level: memory - evaluation). Chapter 9 Reform and Opening-up and the Creation and Development of Socialism with Chinese Characteristics (weight 5/54, level: memory - evaluation). Chapter 10 Socialism with Chinese Characteristics Enters a New Era (Weight 5/54, Grade: Memory - Evaluation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' independent learning, classroom performance, after-class homework, phased tests, practical teaching and composition scores. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the final examination, and the achievement of the course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Basic Principles of Steel Structure", edited by Shen Zuyan, China Construction Industry Press, published in June 2018. 2. "Basic Principles of Steel Structure", edited by Cui Jia, China Construction Industry Press, published in September 2019. 3. Steel Structure Design Standards (GB50017-2017), China Construction Industry Press, 2017. 1. From the Opium War to the May Fourth Movement (Part II), People's Publishing House, 2010 edition. 2. Selected Works of Mao Zedong (Vol. 1-4), People's Publishing House, 1991 edition. 3. Selected Works of Deng Xiaoping (Volume 3), People's Publishing House, 1993 edition. 4. Selected Documents of the Central Committee of the Communist Party of China, Party School Publishing House of the Central Committee of the Communist Party of China, 1994 edition. 5. Selected Works of Jiang Zemin (Volume 1), People's Publishing House, 2006 edition. 6. "Scientific Development Concept Study Reader", Learning Publishing House, 2006 edition. 7. "Selected Documents Since the Founding of the People's Republic of

	China", Central Literature Publishing House, 2011 edition. 8. "Xi Jinping on Governing the Country", Foreign Languages Publishing House, 2014 edition. 9. "Ninety Years of the Communist Party of China", Party History Publishing House, Party Building Reading Publishing House, 2016 edition. 10. "A Brief History of the Communist Party of China", Communist Party History Publishing House, 2021 edition. 11. "100 Questions on Study and Counseling of the Sixth Plenary Session of the Sixth Plenary Session of the 19th Central Committee of the Communist Party of China", Party Building Reading Publishing House, Learning Daily Publishing House, 2021 edition. 12. "100 Questions on Learning and Counseling in the Report of the 20th National Congress of the Communist Party of China", Party Building Reading Publishing House, Learning Daily Publishing House, 2022 edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Theoretical System of Socialism with Chinese Characteristics

Module Name	Theoretical System of Socialism with Chinese Characteristics		
The semester in which this module is taught	Semester 3		
Module Leader	Li Di		
language	Chinese		
Relationship to the curriculum	General studies are compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, case analysis method; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical method: practical teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 75 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.17 hours per week, a total of 18 weeks, 21 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Ideology, Morality and the Rule of Law, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Basic Principles of Marxism, Outline of Modern Chinese History		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	tell the connotation, theoretical achievements and internal logical relationships of Marxism in the Sinicization of the times; Understand that the Communist Party of China insists on combining the basic principles of Marxism with China's specific reality and with China's excellent traditional culture, and continuously promotes the sinicization of Marxism.	R6、7、8、12
	CLO2	Tell the formation and development, main content and living soul of Mao Zedong Thought. Systematically grasp the Marxist positions,	R6、7、8、12

		viewpoints and methods contained in Mao Zedong Thought. Learn to correctly evaluate Comrade Mao Zedong's historical status and Mao Zedong Thought.	
	CLO3	Tell the background and formation process of the theoretical system of socialism with Chinese characteristics, tell the scientific connotation, main content and theoretical essence of Deng Xiaoping Theory, the important thought of "three represents", and the scientific outlook on development, and systematically grasp the Marxist positions, viewpoints and methods contained in the theoretical system of socialism with Chinese characteristics. Strengthen self-confidence in the road, theory, system, and culture of socialism with Chinese characteristics, and enhance political, ideological, and emotional identity.	R6、7、8、12
	CLO4	In social practice, we should better connect the theory we have learned with practice, closely connect the history of the party, the history of new China, the history of reform and opening up, the history of socialist development, and the history of the development of the Chinese nation, closely integrate the great practice of carrying out great struggles, building great projects, promoting great causes, and realizing great dreams, closely combine the reality of building a modern socialist country in an all-round way, closely connect with our own ideological reality, and organically unify theory and practice, ideals and reality, subjectivity and objectivity, knowledge and action.	R6、7、8、12
content	By studying this course, students strive to master the basic theory. understand the historical process, historical changes, and historical achievements of the Communist Party of China leading the people in revolution, construction, and reform; have a deeper understanding of the Communist Party of China's insistence on combining the basic principles of Marxism with China's specific reality and with China's excellent traditional culture, and continuously promoting the sinicization of Marxism; We should have a more accurate grasp of the theoretical achievements formed in the process of sinicization and eraization of Marxism, strengthen our confidence in the road, theory, system, and culture of socialism with Chinese characteristics, and enhance our		

	political, ideological, and emotional identity. The second is to cultivate students' theoretical thinking. Learn to grasp the ideas behind the theory, the strategy in the idea, and the wisdom contained in the strategy, so as to be inspired by ideas, enlightenment of strategy and enlightenment of wisdom. Continuously improve students' ideological and theoretical level, and continuously improve their ability to analyze and solve problems. The third is to help students connect theory with practice. Closely related to the history of the party, the history of new China, the history of reform and opening up, the history of socialist development, and the history of the development of the Chinese nation, closely combined with the great practice of carrying out great struggles, building great projects, promoting great causes, and realizing great dreams, closely combining the reality of building a modern socialist country in an all-round way, closely linking with one's own ideological reality, organically unifying theory and practice, ideals and reality, subjectivity and objectivity, knowledge and action, and consciously devoting oneself to the great practice of socialism with Chinese characteristics. Make due contributions to the great rejuvenation of the Chinese nation. Teaching content: Introduction The historical process and theoretical achievements of the Sinicization of Marxism (weight 3/54, level: memory - evaluation). Chapter 1 Mao Zedong Thought and Its Historical Status (weight 6/54, level: memory - evaluation). Chapter 2 New Democratic Revolutionary Theory (weight 6/54, level: memory - evaluation). Chapter 3 Theory of Socialist Transformation (Weight 6/54, Level: Memory - Evaluation). Chapter 4 Theoretical Achievements of Preliminary Exploration of the Road to Socialist Construction (Weight 6/54, Grade: Memory - Evaluation). Chapter 5 The Formation and Development of the Theoretical System of Socialism with Chinese Characteristics (Weight 6/54, Grade: Memory - Evaluation). Chapter 6 Deng Xiaoping Theory (weight 9/54, level: memory - evaluation). Chapter 7 "Three Represents" Important Ideas (Weight 6/54, Level: Memory - Evaluation). Chapter 8 Scientific Development Concept (Weight 6/54, Level: Memory - Evaluation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting

	for 40% of the total evaluation score. It mainly assesses students' independent learning, classroom performance, after-class homework, phased tests and composition scores. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the final examination, and the achievement of the course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics (2021 Edition) "Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics". Beijing: Higher Education Press: 2021 2. Written by Sun Jutao. Introduction to Deng Xiaoping Theory and the Important Thought of "Three Represents". Wuhan: Wuhan College Press. 2003 3. Zhuang Fuling, editor-in-chief. "Introduction to Mao Zedong Thought". Beijing: Chinese Minmin College Press.1991 4. Selected Works of Mao Zedong, Vol. 1, 2, 3, 4, People's Publishing House, 1991 5. Collected Works of Mao Zedong, Vol. 1-8, People's Publishing House, 1999 edition of Chinese College Press 6. Selected Works of Deng Xiaoping, Vol. 1, 2, 3, People's Publishing House, 1994 edition 7. Report of the 17th National Congress of the Communist Party of China "Holding High the Great Banner of Socialism with Chinese Characteristics and Striving for New Victory in Building a Moderately Prosperous Society in an All-round Way" 8. Report of the 18th National Congress of the Communist Party of China "Unswervingly Advancing Along the Road of Socialism with Chinese Characteristics and Striving to Build a Moderately Prosperous Society in an All-round Way" 9. Report of the 19th National Congress of the Communist Party of China, "Decisive Victory in Building a Moderately Prosperous Society in an All-round Way and Winning the Great Victory of Socialism with Chinese Characteristics in the New Era", People's Publishing House, 2017 edition. 10. "Thirty Lectures on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era", Propaganda Department of the Central Committee of the Communist Party of China, Learning Publishing House, May 2018 edition. 11. "Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era", Propaganda Department of the Central Committee of the Communist Party of China, Learning Publishing House, June 2019

	edition. 12. Excerpts from Xi Jinping's Exposition on "Don't Forget the Original Intention and Keep the Mission in Mind", Institute of Party History and Literature of the Central Committee of the Communist Party of China, Party Building Reading Publishing House, August 2019 edition. 13. Report of the 20th National Congress of the Communist Party of China "Holding High the Great Banner of Socialism with Chinese Characteristics and Uniting and Striving for the Comprehensive Construction of a Modern Socialist Country" 14. "Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era (2023 Edition)", Propaganda Department of the Central Committee of the Communist Party of China, Learning Publishing House, People's Publishing House 1. "Basic Principles of Steel Structure", edited by Shen Zuyan, China Construction Industry Press, published in June 2018. 2. "Basic Principles of Steel Structure", edited by Cui Jia, China Construction Industry Press, published in September 2019. 3. Steel Structure Design Standards (GB50017-2017), China Construction Industry Press, 2017.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Situation and policy

Module Name	Situation and policy		
The semester in which this module is taught	Semester 2		
Module Leader	Rodin		
language	Chinese		
Relationship to the curriculum	General education is a compulsory course		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: complete after-school homework and video resource learning on the cloud class platform;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 50 hours Teaching hours: 48 hours in total Self-study hours: 2 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Be able to understand that culture is related to the foundation of the country and the fortune of the country. Chinese civilization is the only great civilization in the world that has continued to develop in the form of a country, and is in a new historical direction of building a strong country and national rejuvenation. Realizing the great leap of the Chinese nation from standing up, getting rich to becoming strong will inevitably be accompanied by the great development and prosperity of Chinese culture, and will inevitably call for the construction of a socialist cultural power.	R7、R8、R12

CLO2	Since the 18th National Congress of the Communist Party of China, our country has made historic achievements in green and low-carbon development, accelerating the pace of green energy transformation, continuously optimizing and upgrading the industrial structure, continuously improving resource utilization efficiency, and continuously improving environmental quality, laying a solid foundation for further promoting green transformation. In 2024, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Accelerating the Comprehensive Green Transformation of Economic and Social Development", proposing to integrate the requirements of green transformation into the overall economic and social development, and promote green transformation in all directions, fields and regions. In teaching, students should fully understand the importance of comprehensively promoting green transformation, deeply understand the difficulties and challenges facing accelerating the comprehensive green transformation of the economy and society, and encourage young students to give full play to their talents and actively participate in the construction of green China.	R7、R8、R12
CLO3	Being able to educate is the foundation of building a strong country and national rejuvenation. Building an educational power is the dream of the Chinese nation in modern times, and it is the leading task, solid foundation and strategic support for comprehensively promoting the construction of a strong country and the great cause of national rejuvenation with Chinese-style modernization. The "Outline" points out that the educational power we want to build is a socialist education power with Chinese characteristics with strong ideological and political leadership, talent competitiveness, scientific and technological support, people's livelihood security, social synergy and international influence. At present,	R7、R8、R12

		the central task of our party is to unite and lead the people of all ethnic groups across the country to comprehensively promote the great rejuvenation of the Chinese nation with Chinese-style modernization. The country's strategic interests and strategic goals determine the priority orientation of national development and the construction of an educational power must be given priority. In the new direction and new journey of national development, we must clearly understand the new positioning and new tasks of building an educational power.	
	CLO4	Being able to learn history and reality prove that it is impossible for China and the United States not to deal with each other, it is unrealistic to change each other, and no one can bear the consequences of conflict and confrontation. Sino-US relations are not a multiple-choice question about whether to do well, but a mandatory question on how to do well. The key to solving this mandatory question is to anchor the general direction of mutual respect, peaceful coexistence and win-win cooperation. These three principles are not only a summary of the past experience of Sino-US relations, but also a revelation brought about by the conflict between major powers in history, and an important navigation marker to ensure that the two giant ships of China and the United States do not defry, do not stall, and do not collide.	R7、R8、R12
content	The course "Situation and Policy" focuses on the main content, spiritual essence, historical status and guiding significance of the theoretical achievements of Marxism in Sinicization, and fully reflects the historical process and basic experience of the Communist Party of China in continuously promoting the combination of the basic principles of Marxism with China's specific reality. Focusing on the latest achievements in the sinicization of Marxism, we will comprehensively grasp the entry of socialism with Chinese characteristics into a new era, systematically explain the main content and historical status of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and fully reflect the strategic deployment of building a modern socialist power. Teaching content: Topic 1 Accelerate the construction of a socialist cultural power (weight		

	12/48, level: memory + understanding + analysis). Topic 2 Planting a green background to build a beautiful China (weight 12/48, level: memory + understanding + analysis). Topic 3 From a big country in education to an educational power (weight 12/48, level: memory + understanding + analysis). Topic 4 Exploring the correct way of getting along between China and the United States in the new era (weight 12/48, level: memory + understanding + analysis).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a 100-point scale, accounting for 40% of the total evaluation score, including classroom performance, independent learning, etc. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through online open-book form, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Current Affairs Report College Student Edition", Propaganda Department of the Central Committee of the Communist Party of China, "Current Affairs Report" Magazine, March 2025 edition 2. Counseling Reader of the Report of the 20th National Congress of the Communist Party of China, People's Publishing House, October 2022 edition 3. The report of the 20th National Congress of the Communist Party of China, Learning Publishing House, Party Building Reading Publishing House, October 2022 edition
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

College Chinese

Module Name	College Chinese		
The semester in which this module is taught	Semester 2		
Module Leader	Deng Liping		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, text reading method, cultural development method; Interaction methods: heuristic discussion, cross-text comparison, cooperative inquiry; Practical methods: task-driven creation method, contextualized deduction method, cultural project practice method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 50 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 0.78 hours per week, a total of 18 weeks, 14 hours, including: after-school homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	High school Chinese		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Based on the perspective of engineering ethics and humanities, be able to write a report on the solution of complex problems in the field of electrical engineering with a rigorous structure and clear logic, and accurately explain the design ideas and	R10

		innovations of electrical modules or systems. At the same time, use critical thinking and interdisciplinary knowledge to write an objective and comprehensive engineering practice impact assessment analysis report from the dimensions of society, health, safety, law, culture, environment and sustainable development, so as to improve the humanistic and social adaptability of engineering solutions.	
	CLO2	Be able to independently write electrical engineering scientific and technological papers, designs and experimental reports with strict logic and standardized professional terminology, so as to achieve efficient written transformation of academic achievements. At the same time, using the language expression and communication skills tempered in College Chinese courses, in academic reports, project defense, industry exchanges and other scenarios, with clear and smooth oral expression and appropriate written communication, accurately convey professional views, effectively interact with peers and the public, and enhance the dissemination and influence of professional achievements.	R10
	CLO2	be able to form independent learning habits driven by reading humanistic classics and critical thinking, master the methods of literature analysis and knowledge integration, and improve the ability to draw innovative thinking and methodology from interdisciplinary texts; At the same time, we will deeply understand the core value of lifelong learning in professional development and personal growth, and transfer the continuous reading, reflection and self-improvement awareness cultivated in the course to the process of technical iteration and knowledge updating in the field of electrical engineering, so as to realize the coordinated development of professional ability and humanistic quality.	R12
content	Through the study of this course, students will systematically cultivate their reading analysis, text comprehension, aesthetic appreciation and expression and creation abilities in the field of language and literature, so that they can accurately interpret classic literary works, grasp cultural connotations, and skillfully use standardized written and oral language for professional expression; At the same time, it deeply infiltrates the excellent traditional Chinese culture, improves literary aesthetic quality, strengthens the humanistic heritage and interdisciplinary		

	thinking ability, and lays a solid humanistic foundation for professional learning and career development. In addition, guide students to establish a scientific world view, outlook on life and values, cultivate family and country feelings, cultivate professionalism and lifelong learning awareness, realize the organic integration of humanistic spirit and professionalism, and help students adapt to multiple career scenarios with a comprehensive, comprehensive and sustainable attitude. Introduction: Overview of Literary History (weight 1/36, level: memory + understanding). Chapter 1: Pre-Qin and Han Dynasty Wei and Jin Literature (weight 9/36, level: memory + understanding + analysis). Chapter 2: Literature of the Sui and Tang Dynasties and the Two Song Dynasties (weight 14/36, level: memory + understanding + application + evaluation). Chapter 3: Modern Literature of the Yuan, Ming and Qing Dynasties (weight 4/36, memory + understanding + analysis). Chapter 4: Overview of Modern and Contemporary Chinese Literature (weight 4/36, level: memory + understanding + evaluation + creation). Chapter 5: Overview of Foreign Literature (weight 4/36, level: memory + understanding + analysis + evaluation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course.
Read the list	1. "College Chinese", edited by Xu Zhongyu, Qi Senhua and Tan Fan, East China Normal College Press, December 2018, 11th edition. 2. "College Chinese", edited by Xu Zhongyu and Tao Xingzhuan, Peking College Press, November 2018, 10th edition. 3. "College Chinese", edited by Xu Zhongyu, Higher Education Press, July 2016, 5th edition. 4. "College Chinese", edited by Zhang Shouxing and Hu Yudong, Peking College Press, August 2011, 1st edition. 5. College Chinese, edited by Cheng Qing and Liu Hanbo, Peking College Press, February 2012, 1st edition. 6. "New College Chinese", edited by Ma Xiuping and Jiang Xueyan, Peking College Press, August 2007, 1st edition. 7. History of Chinese Literature, edited by Yuan Xingpei, Xinhua Publishing House, May 1998, 1st edition.

	8. "General Theory of Ancient Chinese Literature", edited by Fu Xuancong and Jiang Yin, Liaoning People's Publishing House, July 2010, 1st edition. 9. History of Modern and Contemporary Chinese Literature, edited by Cao Wansheng, Chinese College Press, February 2016, 3rd edition. 10. Selected Foreign Literary Works, edited by Wang Xiangyuan and Gao Hongtao, Beijing Normal College Press, March 2010, 1st edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Foreign Languages(1)

Module Name	College Foreign Languages(1)		
The semester in which this module is taught	Semester 1		
Module Leader	Qi Wen		
language	Chinese, English		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, heuristic teaching method; Interactive methods: comparative pedagogy, cooperative learning pedagogy, discussion pedagogy; Individualized approach: procedural teaching Practical methods: task-driven teaching method, topic-based teaching method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 126 hours Teaching hours: 4 hours per week, 18 weeks in total, 72 hours Self-study hours: 3 hours per week, a total of 18 weeks, 54 hours, including: after-class homework, exam preparation time, etc		
Credits	4 credits		
Prerequisites required and recommended for joining this module	High School English		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	systematically learn English phonetics, basic vocabulary and grammatical structures, and master daily conversation and simple written expression skills; Be able to understand slow English conversations and short announcements, and conduct basic Q&A; Read and understand short general English materials (e.g., notices, emails); Complete the translation of simple sentences into Chinese and English, and initially establish a sense of language application. Have a certain international perspective and be able to	R10

		communicate and exchange in a cross-cultural context.	
	CLO2	Cultivate students with a sense of lifelong learning, a deep understanding of the importance of English as a key tool for continuous learning and personal development, and master effective English self-directed learning strategies through the study of this course, so as to have the ability to use English to continuously acquire new knowledge and adapt to future development and challenges.	R12
content	This course focuses on English language knowledge and application skills, learning strategies and cross-cultural communication, guided by foreign language teaching theory, and aims to cultivate students' comprehensive English application ability. By studying this course, students will develop their listening, speaking, reading and writing skills and independent learning ability. So that they can effectively communicate oral and written information in English in future study, work and social interactions, and at the same time enhance their independent learning ability and improve their comprehensive cultural literacy. Teaching content: Unit 1: College Life (Weight 15/72, Level: Memory + Understanding + Application). Unit 2: Reading (weight 14/72, level: memory + understanding + application). Unit 3: Color (weight 14/72, level: memory + understanding + application). Unit 4: Interview (weight 15/72, memory + understanding + application). Unit 5 : Festival (Weight 14/72, Level: Memory + Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = 30% of the process assessment × + 70% of the final assessment × (1) Process assessment, scored on a percentage system, accounting for 30% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 70% of the total evaluation score. Converted from the national College English level 4 score. Course final assessment score = National College English Level 4 score * 0.2		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Zhang Zhihua, editor-in-chief"General College English - Reading and Writing Course" Volume 1 Revised EditionBeijing: Science Press, 2022.06 2. Zhang Zhihua, editor-in-chief"General College English - Listening and Speaking Tutorial" Volume 1 Revised EditionBeijing: Science Press, 2022.06 3. Steering Committee for Foreign Language Teaching in Colleges and Universities, Ministry of Education, "Guidelines for Teaching English in Colleges and Universities (2020 Edition)" Beijing: Higher Education Press, 2020.12 4. Ministry of Education, National Language and Writing Working Committee, "Chinese English Proficiency Scale".2018.06 5. Compiled by the National College English Level 4 and 6 Examination CommitteeNational College English Level 4 and 6 Examination Syllabus (2016 Revised Edition), Shanghai: Shanghai Foreign Language Education Press, 2016.09 6. Yan Wenqingchief editor. Ideological and Political Teaching Guide for College English Courses.Shanghai:East China Normal College Press，2021.05
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Foreign Languages(2)

Module Name	College Foreign Languages(2)		
The semester in which this module is taught	Semester 2		
Module Leader	Qi Wen		
language	Chinese, English		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, heuristic teaching method; Interactive methods: comparative pedagogy, cooperative learning pedagogy, discussion pedagogy; Individualized approach: procedural teaching Practical methods: task-driven teaching method, topic-based teaching method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 126 hours Teaching hours: 4 hours per week, 18 weeks in total, 72 hours Self-study hours: 3 hours per week, a total of 18 weeks, 54 hours, including: after-class homework, exam preparation time, etc		
Credits	4 credits		
Prerequisites required and recommended for joining this module	College Foreign Languages(1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Improve the ability to use comprehensive language, and be proficient in the use of complex sentence patterns and chapter structures. Be able to understand academic lectures or professional-related audio at a moderate pace, participate in group discussions and express opinions; Read medium-length professional popular science articles to extract core information; Translate basic literature passages related to the profession to ensure the logical flow of the translation. Write a clearly structured	R10

		outline of the lab report or the first draft of a technical document.	
	CLO2	Cultivate students with a sense of lifelong learning, a deep understanding of the importance of English as a key tool for continuous learning and personal development, and master effective English self-directed learning strategies through the study of this course, so as to have the ability to use English to continuously acquire new knowledge and adapt to future development and challenges.	R12
content	This course focuses on English language knowledge and application skills, learning strategies and cross-cultural communication, guided by foreign language teaching theory, and aims to cultivate students' comprehensive English application ability. By studying this course, students will develop their listening, speaking, reading and writing skills and independent learning ability. So that they can effectively communicate oral and written information in English in future study, work and social interactions, and at the same time enhance their independent learning ability and improve their comprehensive cultural literacy. Teaching content: Unit 1: Affection (weight 15/72, level: memory + understanding + application). Unit 2: Education (weight 15/72, level: memory + comprehension + application). Unit 3 :P ersonality (weight 14/72, level: memory + understanding + application). Unit 4： Name and Appearance（权重 14/72，记忆+理解+应用） Unit 5 ：Chinese Traditional Medicine（权重 14/72，级别：记忆+理解+应用）		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = 30% of the process assessment × + 70% of the final assessment × (1) Process assessment, scored on a percentage system, accounting for 30% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 70% of the total evaluation score. Converted from the national College English level 4 score. Course final assessment score = National College English Level 4 score * 0.2		
Study and exam	The evaluation is based on a 100-point system, and 60 points are the		

requirements	passing score for this course
Read the list	1. Zhang Zhihua, editor-in-chief"Universal College English - Reading and Writing Course" Volume 2 Revised EditionBeijing: Science Press, 2022.06 2. Zhang Zhihua, editor-in-chief"General College English - Listening and Speaking Course" Volume 2 Revised EditionBeijing: Science Press, 2022.06 3. Steering Committee for Foreign Language Teaching in Colleges and Universities, Ministry of Education, "Guidelines for Teaching English in Colleges and Universities (2020 Edition)" Beijing: Higher Education Press, 2020.12 4. Ministry of Education, National Language and Writing Working Committee, "Chinese English Proficiency Scale".2018.06 5. Compiled by the National College English Level 4 and 6 Examination CommitteeNational College English Level 4 and 6 Examination Syllabus (2016 Revised Edition), Shanghai: Shanghai Foreign Language Education Press, 2016.09 6. Yan Wenqingchief editor. Ideological and Political Teaching Guide for College English Courses.Shanghai:East China Normal College Press，2021.05
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Foreign Languages(3)

Module Name	College Foreign Languages(3)		
The semester in which this module is taught	Semester 3		
Module Leader	Qi Wen		
language	Chinese, English		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, heuristic teaching method; Interactive methods: comparative pedagogy, cooperative learning pedagogy, discussion pedagogy; Individualized approach: procedural teaching Practical methods: task-driven teaching method, topic-based teaching method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 54 credit hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 1 hour per week, a total of 18 weeks, 18 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	College Foreign Language (1), College Foreign Language (2)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Deepen professional English skills, be able to write standardized English experiment reports, technical documents and paper abstracts; Understand the lectures of professional courses and reiterate the key points, and fluently state the technical solutions and achievements; Read and analyze English literature in the field of electrical automation, summarize technical logic; Translate formal and sports professional materials with the help of tools; Participate in international conference discussions and demonstrate	R10

		cross-cultural communication awareness.	
	CLO2	Cultivate students with a sense of lifelong learning, a deep understanding of the importance of English as a key tool for continuous learning and personal development, and master effective English self-directed learning strategies through the study of this course, so as to have the ability to use English to continuously acquire new knowledge and adapt to future development and challenges.	R12
content	This course focuses on English language knowledge and application skills, learning strategies and cross-cultural communication, guided by foreign language teaching theory, and aims to cultivate students' comprehensive English application ability. By studying this course, students will develop their listening, speaking, reading and writing skills and independent learning ability. So that they can effectively communicate oral and written information in English in future study, work and social interactions, and at the same time enhance their independent learning ability and improve their comprehensive cultural literacy. Teaching content: Unit 1: Insights into Life (weight 8/36, level: memory + understanding + application). Unit 2: Stories (weight 6/36, level: memory + understanding + application). Unit 3 : Animals (1) (Weight 6/36, Level: Memory + Understanding + Application) Unit 4: Food (weight 8/36, memory + understanding + application). Unit 5 : Current Affairs (weight 8/36, level: memory + understanding + application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = 30% of the process assessment × + 70% of the final assessment × (1) Process assessment, scored on a percentage system, accounting for 30% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 70% of the total evaluation score. Converted from the national College English level 4 score. Course final assessment score = National College English Level 4 score * 0.2		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		

Read the list	1. Zhang Zhihua, editor-in-chief"General College English - Reading and Writing Course" Volume 3 Revised EditionBeijing: Science Press, 2021.06 2. Zhang Zhihua, editor-in-chief"General College English - Listening and Speaking Course" Volume 3 Revised EditionBeijing: Science Press, 2021.06 3. Steering Committee for Foreign Language Teaching in Colleges and Universities, Ministry of Education, "Guidelines for Teaching English in Colleges and Universities (2020 Edition)" Beijing: Higher Education Press, 2020.12 4. Ministry of Education, National Language and Writing Working Committee, "Chinese English Proficiency Scale".2018.06 5. Compiled by the National College English Level 4 and 6 Examination CommitteeNational College English Level 4 and 6 Examination Syllabus (2016 Revised Edition), Shanghai: Shanghai Foreign Language Education Press, 2016.09 6. Yan Wenqingchief editor. Ideological and Political Teaching Guide for College English Courses.Shanghai:East China Normal College Press，2021.05
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Foreign Languages(4)

Module Name	College Foreign Languages(4)		
The semester in which this module is taught	Semester 4		
Module Leader	Qi Wen		
language	Chinese, English		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, heuristic teaching method; Interactive methods: comparative pedagogy, cooperative learning pedagogy, discussion pedagogy; Individualized approach: procedural teaching Practical methods: task-driven teaching method, topic-based teaching method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 54 credit hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 1 hour per week, a total of 18 weeks, 18 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	College Foreign Language (1), College Foreign Language (2), College Foreign Language (3)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Deepen English skills, be able to write standardized English experimental reports, technical documents and paper abstracts; Understand the lectures of professional courses and reiterate the key points, and fluently state the technical solutions and achievements; Read and analyze English literature in the field of electrical automation, summarize technical logic; Translate formal and sports professional materials with the help of tools; Participate in international conference discussions and demonstrate	R10

		cross-cultural communication awareness.	
	CLO2	Cultivate students with a sense of lifelong learning, a deep understanding of the importance of English as a key tool for continuous learning and personal development, and master effective English self-directed learning strategies through the study of this course, so as to have the ability to use English to continuously acquire new knowledge and adapt to future development and challenges.	R12
content	This course focuses on English language knowledge and application skills, learning strategies and cross-cultural communication, guided by foreign language teaching theory, and aims to cultivate students' comprehensive English application ability. By studying this course, students will develop their listening, speaking, reading and writing skills and independent learning ability. So that they can effectively communicate oral and written information in English in future study, work and social interactions, and at the same time enhance their independent learning ability and improve their comprehensive cultural literacy. Teaching content: Unit 1 : Art (weight 8/36, level: memory + understanding + application). Unit 2: Digital Technology (Weight 8/36, Level: Memory + Understanding + Application). Unit 3: Environment Protection (weight 6/36, level: memory + understanding + application). Unit 4: Health (weight 6/36, memory + comprehension + application). Unit 5: On Friendship (Weight 8/36, Level: Memory + Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = 30% of the process assessment × + 70% of the final assessment × (1) Process assessment, scored on a percentage system, accounting for 30% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 70% of the total evaluation score. Converted from the national College English level 4 score. Course final assessment score = National College English Level 4 score * 0.2		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		

Read the list	1. Zhang Zhihua, editor-in-chief"Universal College English - Reading and Writing Course" Volume 4 Revised EditionBeijing: Science Press, 2024.03 2. Zhang Zhihua, editor-in-chief"General College English - Listening and Speaking Course" Volume 4 Revised EditionBeijing: Science Press, 2024.03 3. Steering Committee for Foreign Language Teaching in Colleges and Universities, Ministry of Education, "Guidelines for Teaching English in Colleges and Universities (2020 Edition)" Beijing: Higher Education Press, 2020.12 4. Ministry of Education, National Language and Writing Working Committee, "Chinese English Proficiency Scale".2018.06 5. Compiled by the National College English Level 4 and 6 Examination CommitteeNational College English Level 4 and 6 Examination Syllabus (2016 Revised Edition), Shanghai: Shanghai Foreign Language Education Press, 2016.09 6. Yan Wenqingchief editor. Ideological and Political Teaching Guide for College English Courses.Shanghai:East China Normal College Press，2021.05
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Beauty and life---- ladies' school

Module Name	Beauty and life---- ladies' school		
The semester in which this module is taught	Semester 2		
Module Leader	Chen Su		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching demonstration method, case analysis method, and situation simulation guidance method; Interaction methods: group discussion method, role-playing method; Individualized method: unit teaching, independent design Practical methods: skill practical training method, social practice experience method, project planning practice method;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 25 hours Teaching hours: 1 hour per week, 18 weeks in total, 18 hours Self-study hours: 0.39 hours per week, a total of 18 weeks, 7 hours, including: after-class homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	be able to systematically improve the literacy of humanities and social sciences, deeply understand the traditional Chinese etiquette culture and modern civilization norms, and shape elegant and	R8、R10

		decent words and deeds and good moral cultivation; In the process of project design, teamwork and customer communication, we abide by professional ethics and fulfill social responsibilities with a professional and humanistic attitude, so as to achieve the harmonious unity of engineering technology and humanistic spirit.	
content	The course is mainly aimed at the characteristics of contemporary female college students, cultivating the appearance, conversation, manners, thinking and behavior habits of female college students, so that they have the feminine charm rich in the connotation of Chinese beauty, based on the excellent concept of traditional culture, guide contemporary female college students to be good, elegant and virtuous, self-love and self-reliance, teach them to initially master basic daily life skills, guide and explore their interests and hobbies, and promote the good development of women's potential, so that they can cultivate both virtue and art, be full of spirit, and have excellent taste. better adapt to the needs of society and strive to become a modern professional woman with "self-esteem, self-confidence, self-improvement, and self-reliance". Teaching content: Chapter 1: Inner cultivation in the "heart" (weight 12/18, level: memory + understanding + application + evaluation) Chapter 2: Externalization in "form" (weight 6/18, level: memory + understanding + application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 60% + final assessment × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 40% of the overall evaluation score. The assessment is mainly conducted through course papers to evaluate the achievement of course ability goals and literacy goals.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course.		
Read the list	1. "Good Love", edited by Chen Guo, published by People's Daily Publishing House, April 2018; 2. "Women's Psychology", edited by Song Xintian, Shanxi Normal College Press, published in September 2012; 3. "Women and Power", Mary Beard, Tianjin People's Publishing House, February 2019; 4. "Chinese Women's Feelings and Sexuality", Li Yinhe, Inner Mongolia College Press, August 2009;		

	5. "Manual for the Use of the Female Human Body", Wang Shu, China Zhigong Publishing House, published in January 2007; 6. "Eight Tips for Women in the Workplace", Harvard Business Review, Zhejiang Publishing Group, October 2018.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Beauty and life ---- gentleman's school

Module Name	Beauty and life ---- gentleman's school		
The semester in which this module is taught	Semester 2		
Module Leader	Li Shibai		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching demonstration method, case analysis method, and situation simulation guidance method; Interaction methods: group discussion method, role-playing method; Individualized method: unit teaching, independent design Practical methods: skill practical training method, social practice experience method, project planning practice method;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 25 hours Teaching hours: 1 hour per week, 18 weeks in total, 18 hours Self-study hours: 0.39 hours per week, a total of 18 weeks, 7 hours, including: after-class homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	be able to deeply absorb the spiritual core of "self-cultivation, family governance, and peace of the world" in the excellent traditional Chinese culture, systematically cultivate traditional virtues	R8

		such as benevolence, righteousness, propriety, wisdom, and trustworthiness, and shape the personal character of integrity, integrity, humility and responsibility; At the same time, the humanistic feelings, social responsibility and engineering ethics cultivated in the course are combined, and in the project design, technology research and development and engineering practice of electrical engineering, strictly abide by the professional ethics, practice the mission of engineers in the way of a gentleman, and fully consider the impact of technology application on the society, environment and public interests on the basis of ensuring the quality and safety of the project, so as to realize the coordinated development of professional ability and humanistic quality.	
content	Through the study of this course, students can understand what a gentleman's personality is, improve students' self-cultivation, and cultivate students with both virtue and ability; learn traditional Chinese culture, feel the 5,000-year-old Chinese civilization and strong cultural heritage; Improve students' awareness of "gentlemen", guide students to improve themselves, and pursue a more valuable life. Teaching content: Chapter 1: The Meaning of a Gentleman (weight 2/18, level: memory + understanding + application + evaluation). Chapter 2: The Virtue of a Gentleman (weight 2/18, level: memory + understanding + application + evaluation). Chapter 3: The Gentleman's Etiquette (weight 2/18, level: memory + understanding + application). Chapter 4: The Beauty of a Gentleman (weight 4/18, level: memory + understanding + application). Chapter 5: The Gentleman's Style (weight 4/18, level: memory + understanding + application). Chapter 6: The Art of a Gentleman (weight 4/18, level: memory + understanding + application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 60% + final assessment × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 40% of the overall evaluation score. The assessment is mainly conducted through course papers to evaluate the achievement of course ability goals and literacy goals.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course.
Read the list	1. "Translation and Commentary on the Analects", translated and annotated by Yang Bojun, Zhonghua Book Company, 1980 edition; 2. A Brief History of Chinese Philosophy, by Feng Youlan, New World Publishing House, 2004 edition; 3. "The Course of Beauty", by Li Zehou, Cultural Relics Publishing House, 1981, 1989 editions; 4. "The Study of a Gentleman", written by Xu Xiaoyue, Jiangsu People's Publishing House, 2025 edition; 5. "Seeing the Gentleman", by Hao Yongwei, Guangxi Normal College Press, 2024 edition; 6. "The Great Changes in History", by Gong Pengcheng, Zhejiang Literature and Art Publishing House, 2023 edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Health education for college students

Module Name	Health education for college students		
The semester in which this module is taught	Semester 1.2		
Module Leader	Zhuang Yanling, Liu Shuting, Luo Jing		
language	Chinese		
Relationship to the curriculum	General studies are compulsory courses		
Teaching methods	Teacher-centered methods: teaching methods, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Practical method: group psychological counseling		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 50 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 1 hour per week, a total of 14 weeks, 14 hours, including: after-class homework, pre-class preview		
Credits	2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the relevant theories and basic concepts of health education, clarify the standards and significance of physical health and mental health, and be familiar with the basic common sense related to physical and mental health, common physical and mental diseases and symptoms, and basic methods of maintaining physical and mental health.	R12
	CLO2	Enhance the awareness of self-care and psychological crisis prevention, establish a sense of autonomy for healthy development, take the	R10、12

		initiative to explore one's own psychological characteristics and personality characteristics, be able to objectively evaluate one's physical condition, psychological condition, behavioral ability, etc., correctly understand oneself, accept oneself, and take the initiative to develop good living habits and hygiene habits, care for life, and cultivate life feelings.	
	CLO3	Master the necessary knowledge of injury prevention and infection prevention, first aid common sense, self-exploration skills, psychological adjustment skills and psychological development skills, such as artificial respiration, chest compressions, environmental adaptation skills, stress management skills, communication skills, problem solving skills, self-management skills, interpersonal skills and career planning skills. Be able to self-adjust or seek help when encountering psychological problems, actively explore the life conditions that suit you and adapt to society.	R10、12
content	The course of "Health Education for College Students" aims to enable students to clarify the standards and meanings of health, master the knowledge of physical and mental diseases, infectious disease prevention and control, emergency and first aid, drug use, psychological development characteristics, etc., establish the correct and scientific mental health concept of college students, correctly understand and accept themselves, continuously optimize psychological quality, enhance psychological resilience, master self-exploration, psychological adjustment and psychological development skills to cope with stress, setbacks, interpersonal relationships and psychological crises, and enhance college students' consciousness of maintaining mental health. Improve self-care and disease prevention ability, so that college students can consciously choose healthy behaviors and lifestyles, and promote the overall improvement of college students' physical and mental quality. Teaching content: Chapter 1 Health Education Curriculum Guide (Weight 2/36, Level: Understanding) Chapter 2 Adaptation of Freshmen (Weight 2/36, Level: Understanding, Application, Analysis) Chapter 3 Sexual Health Education for College Students (Weight 4/36, Level: Understanding, Application, Analysis) Chapter 4 Healthy Lifestyle (Weight 2/36, Level: Understanding,		

	Application, Analysis) Chapter 5 Interpersonal Communication (weight 4/36, level: understanding, application, analysis) Chapter 6 AIDS Prevention Education (Weight 2/36, Level: Understanding, Application) Chapter 7 Disease Prevention (Weight 2/36, Level: Understanding, Application, Analysis) Chapter 8 Common Psychological Problems and Interventions in College Students (Weight 4/36, Level: Understanding, Application, Analysis) Chapter 9 Love Psychology (weight 2/36, level: understanding, application, analysis) Chapter 10 Healthy Personality Shaping (Weight 2/36, Level: Understanding, Application, Analysis) Chapter 11 Drug Prevention (Weight 2/36, Level: Understanding, Application, Analysis) Chapter 12 Emotion Regulation and Stress Management (Weight 4/36, Level: Understanding, Application, Analysis) Chapter 13 Life Education (Weight 2/36, Level: Understanding, Application, Analysis) Chapter 14 Safety and Emergency Avoidance (Weight 2/36, Level: Understanding, Application, Analysis)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. The main assessment of students' procedural assessment consists of classroom performance, homework, phased testing, and independent learning and the composition of scores. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the final paper examination and the achievement of the course objectives is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Health Education for College Students", edited by He Yushan and Liang Jinyun, Huazhong College of Science and Technology Press, published in July 2024.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Military theory and training

Module Name	Military theory		
The semester in which this module is taught	Semester 1		
Module Leader	Zhao Liping		
language	Chinese		
Relationship to the curriculum	Public compulsory courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Practical method: military training		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 74 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 6.2 hours per week, a total of 9 weeks, 56 hours, including: after-school homework, exam preparation time, etc		
Credits	2.5 credits		
Prerequisites required and recommended for joining this module	Basic knowledge of history, geography, politics and other basic knowledge in high school, able to understand basic concepts such as international relations and national security.		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Guide students to establish a correct world view, outlook on life, and values.	R9、R12
	CLO2	Master military fundamentals and basic military skills.	R9、R12
	CLO3	Enhance the concept of national defense, national security, and awareness of dangers and crises, carry forward the spirit of patriotism, inherit the red gene, and improve students' comprehensive national defense quality	R9、R12

content	Through studying this course, students can understand and master the basic knowledge of the military, enhance the concept of national defense, national security and awareness of dangers and crises, carry forward the spirit of patriotism, inherit the red gene, and improve the comprehensive national defense quality of students. Teaching content: Chapter 1 China's National Defense (weight 5/18, level: understanding, application). Chapter 2 National Security (weight 4/18, level: understanding, application). Chapter 3 Military Thought (weight 3/18, level: understanding, analysis, application). Chapter 4 Modern Warfare (weight 3/18, level: understanding, analysis, application). Chapter 5 Information Equipment (Weight 3/18, Level: Understanding, Application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. National Defense Education Office. Outline of National Defense History" [M], Beijing, National Defense College Press, 2012. 2. Xunji. "New Military Course Course Tutorial for College Students" [M], Beijing, National Defense College Press, published in 2015. 3. Xu Yan. Du Wenlong, "Military Theory", National Defense College of the Chinese People's Liberation Army, 2025.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Military theory and training

Module Name	Training		
The semester in which this module is taught	Semester 1		
Module Leader	Li Ruqiang		
language	Chinese		
Relationship to the curriculum	Public compulsory courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Practical method: military training		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 74 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 6.2 hours per week, a total of 9 weeks, 56 hours, including: after-school homework, exam preparation time, etc		
Credits	2.5 credits		
Prerequisites required and recommended for joining this module	Basic knowledge of history, geography, politics and other basic knowledge in high school, able to understand basic concepts such as international relations and national security.		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Guide students to establish a correct world view, outlook on life, and values.	R9、R12
	CLO2	Master military fundamentals and basic military skills.	R9、R12
	CLO3	Enhance the concept of national defense, national security, and awareness of dangers and crises, carry forward the spirit of patriotism, inherit the red gene, and improve students' comprehensive national defense quality.	R9、R12
content	Through studying this course, students can understand and master the basic knowledge of the military, enhance the concept of national		

	defense, national security and awareness of dangers and crises, carry forward the spirit of patriotism, inherit the red gene, and improve the comprehensive national defense quality of students. Teaching content: Chapter 1 Common Doctrine Education and Training (Weight 6/18, Level: Understanding). Chapter 2 Shooting and Tactical Training (Weight 3/18, Level: Understanding, Application) Chapter 3 Defense Skills and Wartime Protection Training (Weight 5/18, Level: Understanding, Application) Chapter 4 Combat Readiness Basic and Applied Training (Weight 4/18, Level: Understanding, Application).
Assessment form	1. Curriculum assessment: process assessment. 2. Grade evaluation: comprehensive evaluation based on students' training time, actual performance, and mastery level. The grades are divided into four grades: excellent, good, passing and failing.
Study and exam requirements	The grades are divided into four grades: excellent, good, passing and failing
Read the list	1. National Defense Education Office. Outline of National Defense History" [M], Beijing, National Defense College Press, 2012. 2. Xunji. "New Military Course Course Tutorial for College Students" [M], Beijing, National Defense College Press, published in 2015. 3. Xu Yan. Du Wenlong, "Military Theory", National Defense College of the Chinese People's Liberation Army, 2025.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Collegiate Sports (Clubs)

Module Name	Collegiate Sports (Clubs)		
The semester in which this module is taught	1st, 2nd, 3rd, and 4th semesters		
Module Leader	Wang You		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching, demonstration, and questioning; Interactive methods: inquiry-based problem learning, group discussion, cooperative learning method; Individualized learning methods: Feynman learning method, physical education teaching Practical methods: task-driven method, practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 36 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours		
Credits	5 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Carry out curriculum ideological and political construction, systematically carry out education on socialism with Chinese characteristics and the Chinese dream, socialist core values education, rule of law education, labor education, mental health education, and excellent traditional Chinese culture education, and cultivate students to strengthen their ideals and beliefs, and have political identity, family and country feelings, cultural literacy, constitutional awareness of the rule of law, and moral accomplishment.	R9
	CLO2	have high cultural accomplishment, strong aesthetic ability and noble moral sentiments, and have a rigorous and scientific way of thinking and	R9

		truth-seeking spirit; have a sound psychology, a healthy physique, and civilized behavioral habits; have a critical spirit, be able to discover, analyze, question, and evaluate phenomena and problems in the professional field, and express personal opinions;	
	CLO3	have a critical spirit, be able to discover, analyze, question, and evaluate phenomena and problems in the professional field, and express personal opinions;	R12
content	The "College Physical Education (Club)" course is a compulsory general education course for all undergraduate majors in the College, aiming to enhance students' physical fitness, improve health and improve physical literacy through physical exercise, reasonable physical education and scientific exercise This curriculum is not only an important part of the school curriculum system, but also the central link of school physical education, which is of great significance for the implementation of quality education and the cultivation of all-round development talents. Adhering to the concept of "health first, all-round development, highlighting key points, and serving the locality", students can learn and exercise in happiness, master at least two sports skills, and lay the foundation for lifelong physical exercise. The course content includes: competition, confrontation, cooperation, challenge, victory, failure and other elements of developing psychological quality; There are also sports and humanistic spirits such as the principle of fairness, hard work, self-sacrifice, and team spirit. At the same time, it is one of the compulsory basic disciplines in the school's teaching subjects, and is an indispensable key to cultivating socialist modernization talents with all-round development of moral, intellectual, physical and aesthetic. The first semester is mainly based on basketball, volleyball, and track and field, and the second semester is mainly based on students' interests, hobbies, and specialties, choosing a content (basketball, football, volleyball, badminton, table tennis, martial arts, etc.), and the learning content of the third and fourth semesters is the same as the second semester, which is the consolidation and improvement of the second semester. Course objective 1: Cultivate students' correct understanding of this course, improve students' awareness of sports participation, and enable students to consciously, actively and regularly participate in physical exercise. Let students master the basic principles and methods of scientific exercise, such as mastering reasonable and effective fitness methods, prevention and treatment of sports injuries, self-evaluation of exercise effects, etc., and use scientific theoretical knowledge to guide practice. Course objective 2: Through physical education courses, master two sports and exercise methods that you like more, and form certain hobbies and interests in a certain aspect, be able to scientifically carry out physical exercise, improve your athletic ability, develop your athletic ability, participate in challenging activities and sports competitions, and		

	lay a good foundation for "lifelong sports". Curriculum objective 3: Set physical education curriculum objectives; consciously improve the psychological state through physical activities, overcome psychological obstacles, 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 sports. Show good sportsmanship and cooperative spirit, and correctly handle competition and cooperation. Teaching content: Part 1 Learning of Physical Education Theoretical Knowledge (Weight 4/36, Level: Memory + Understanding + Application) Part 2 Learning of Basic Physical Education Skills (Weight 32/36, Level: Memory + Comprehension + Application)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, healthy running, homework, independent learning, and completion of phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of skill tests to evaluate the achievement of course objectives.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1."College Physical Education and Health Course", edited by Zhang Juan et al., Beijing Sport College Press, September 2019, 1st edition. 2. "College Physical Education and Health (Illustrated Demonstration + Video Guidance)", edited by Yuan Shoulong, Publishing House of People's Posts and Telecommunications, 1st edition, 2022. 3. College Physical Education and Health Education, edited by Li Nianmao et al., Beijing Institute of Technology Press, April 2022, 1st edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Career Planning and Employment Guidance (1)

Module Name	Career Planning and Employment Guidance (1)		
The semester in which this module is taught	Semester 1		
Module Leader	Liu Yanyu		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching methods, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized approach: independent design Method of practice: group cooperation		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 9 hours Teaching hours: 2 hours per week, 4 weeks in total, 8 hours Self-study hours: 0.25 hours per week, a total of 4 weeks, 1 hour, including: after-school homework, exam preparation time, etc		
Credits	0.5 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	understand the rich connotation of career planning, grasp the positive significance of career planning, and establish a career awareness of independent planning; Master the relevant theories and methods of environmental analysis and self-exploration, and be able to use career planning tools for planning.	R8、R9、R12
	CLO2	Be able to accurately evaluate social, occupational and family information related to the target occupation; master	R8、R9、R12

		methods for exploring and describing one's interests, character, skills and values; Master the methods of personnel and job matching analysis, and formulate career goals and plan development based on the information of personnel and job matching analysis. master environmental exploration skills, independently analyze the employment and entrepreneurship situation, employment and entrepreneurship policies, industry development and social needs; master self-exploration skills, the ability to reasonably and accurately position personal job search goals;	
	CLO3	By guiding and training students to explore their own personality characteristics, students' self-awareness is awakened; Through the study and writing of career planning, clarify the planning path and take the initiative to implement it.	R8、R9、R12
content	Through the study of this course, students will be helped to understand the social function of the College, understand the school's school philosophy and talent training positioning, enhance role awareness, improve adaptability, establish a scientific view of talent, and establish career ideals as soon as possible. At the same time, let students understand the concepts of career, career and career planning; understand the significance of career planning; Understand the development profile, curriculum system, training objectives and comprehensive skills required by the major; master the content and steps of career planning; Know the development tasks at the College stage and make career plans. Teaching content: Chapter 1 Cognitive Career (Weight 1/8, Level: Memory + Comprehension). Chapter 2 Self-awareness (weight 1/8, level: memory + understanding + application). Chapter 3 Career exploration (weight 3/8, level: understanding + application). Chapter 4 Career Decision Making (Weight 3/8, Level: Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process		

	assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, independent learning, homework, and completion of phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. Submit a career plan for college students that meets personal characteristics for the final assessment.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	Li Xinwei, Wang Junchuan, Li Xiugang. Career planning and employment guidance for college students. Shanghai: Shanghai Jiao Tong College Press. 2023
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Career Planning and Employment Guidance (2)

Module Name	Career Planning and Employment Guidance (2)		
The semester in which this module is taught	Semester 4		
Module Leader	Qiao Lin and Yu Yanyan		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching methods, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized approach: independent design Method of practice: group cooperation		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 8 hours Teaching hours: 2 hours per week, 2 weeks in total, 4 hours Self-study hours: 1 hour per week, a total of 4 weeks, 4 hours, including: after-school homework, exam preparation time, etc		
Credits	0.2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the relevant information of the labor market, relevant occupational classification knowledge and basic knowledge of employment and entrepreneurship; master the positioning principles of personal job search goals; Understand the structure, principles and requirements of job application writing; master the content and importance of workplace etiquette;	R8、R9、R12
	CLO2	master information retrieval and	R8、R9、

		management skills, understand employment information classification, sorting and screening and identification methods; understand career decision-making skills, know how to write personalized job resumes, and carefully design them based on the requirements and characteristics of the job application; master general skills in the workplace, be familiar with the basic common sense and operation points of workplace etiquette; Be able to understand and obtain environmental information related to the target occupation through interviews, online searches, professional exploration and other methods; Through mock interviews, group mutual evaluation, etc., the initial job resume can be drawn up and the interview ability can be understood.	R12
	CLO3	By guiding and training students to independently analyze the employment and entrepreneurship situation and employment information, students can cultivate their sense of resource sharing and teamwork; Through the study and training of mock interviews in the form of student groups, students can cultivate students' good teamwork spirit and team communication skills, and cultivate students' strong teamwork skills. Establish professional ethics, improve professional quality, combine personal development goals with organizational construction and the future of the country and the nation, and cultivate students' strong sense of collective honor and social responsibility to serve the motherland.	R8、R9、R12
content	Through the study of this course, students can systematically recognize their own interests, abilities and values, scientifically plan their career goals, and avoid blind career choice. Combined with professional characteristics and industry needs, formulate personalized development paths to improve self-management and decision-making capabilities. Cultivate the awareness of dynamically adjusting career planning, master the method of goal decomposition and implementation plan, and enhance the control of career development Enhance practical skills in		

	job hunting Systematically train core competencies such as resume writing, interview skills, and professional social networking to improve job matching efficiency. Guide students to understand industry trends and policies and regulations, cultivate the literacy to flexibly respond to changes in the employment environment, emphasize the combination of personal value and social needs, advocate a positive employment mentality and professional ethics, cultivate a sense of lifelong development, and establish sustainable career growth thinking and learning ability Teaching content: Chapter 1 Professionalism (weight 2/4, level: memory + understanding). Chapter 2 Vocational Skills (Weight 2/4, Level: Memory + Understanding + Application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, independent learning, homework, and completion of phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. Submit papers for final assessment.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	Huang Shumin Lu Min Editor-in-Chief. Career Planning and Employment Guidance for College Students (Second Edition). Beijing: Aviation Industry Press
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Career Planning and Employment Guidance (3)

Module Name	Career Planning and Employment Guidance (3)		
The semester in which this module is taught	6th semester		
Module Leader	Joleen		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching methods, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized approach: independent design Method of practice: group cooperation		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 8 hours Teaching hours: 2 hours per week, 3 weeks in total, 6 hours Self-study hours: 0.67 hours per week, a total of 3 weeks, 2 hours, including: after-school homework, exam preparation time, etc		
Credits	0.3 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the theories and methods of cognition of personal and professional characteristics, combined with social environment analysis, to understand the employment situation and policies and regulations. Familiar with employment and entrepreneurship policies and employment rights protection; master the structure, principles and requirements of job application material writing; master the skills and methods of interview application; Master the channels and	R8、R9、R12

	processing methods for collecting employment information.	
CLO2	Master information retrieval and management skills, and be familiar with employment information classification, sorting, screening and identification methods; Master career decision-making skills, be proficient in writing personalized job resumes, and carefully design them based on the requirements and characteristics of the job you are applying for. master general skills in the workplace, be familiar with the basic common sense and operation points of workplace etiquette; master job search communication skills, be familiar with interview types and inspection focus; Familiar with the principles and requirements of signing and terminating employment agreements and labor contracts. Through online platforms, professional exploration, career interviews and other methods, we can better obtain employment and entrepreneurship situation, employment and entrepreneurship policies and employment information related to job search goals; be able to reasonably position personal job search goals through self-inventory, career assessment, feedback from others, etc.; Through online resume submission, mock interviews, group mutual evaluation, etc., improve job resumes, master and improve interview skills.	R8、R9、R12
CLO3	By guiding and training students to independently analyze the employment and entrepreneurship situation and employment information, students can cultivate their sense of resource sharing and teamwork; Through the study and training of mock interviews in the form of student groups,	R8、R9、R12

		students can cultivate students' good teamwork spirit and team communication skills, and cultivate students' strong teamwork skills. Establish professional ethics, improve professional quality, combine personal development goals with organizational construction and the future of the country and the nation, and cultivate students' strong sense of collective honor and social responsibility to serve the motherland.	
content	Through the study of this course, students can understand the latest employment environment of society and industry in terms of employment environment and policies and regulations, be familiar with current employment policies and relevant laws and regulations, lay a solid information foundation for job search, and then improve the success rate of job search. Secondly, at the level of employment concept and expectation, guide students to base themselves on reality, establish correct employment concepts, help them determine reasonable employment expectations, and make students more rational and pragmatic in the face of employment choices. Thirdly, regarding employment skills, it will help students analyze the advantages and disadvantages of their employment skills, and find effective remedies and adjustments for their disadvantages to enhance their employment competitiveness. Finally, in terms of psychological adjustment, help students understand common psychological problems in employment, master scientific psychological adjustment methods, and guide them to face various challenges in the employment process with a positive attitude and successfully pass the employment stage Teaching content: Chapter 1 Employment Environment and Policy (Weight 1/6, Level: Memory + Understanding). Chapter 2 Employment Preparation (Weight 1/6, Level: Memory + Understanding + Application). Chapter 3 Employment Skills Improvement (weight 3/6, level: memory + understanding + application). Chapter 4 Protection of Employment Rights and Interests (weight 1/6, level: memory + understanding).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, independent learning, homework, and		

	completion of phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. Submit a resume for the final assessment.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	Huang Shumin Lu Min Editor-in-Chief. Career Planning and Employment Guidance for College Students (Second Edition). Beijing: Aviation Industry Press
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Entrepreneurship Education(1)

Module Name	Entrepreneurship Education(1)		
The semester in which this module is taught	Semester 2		
Module Leader	Dong Li		
language	Chinese		
Relationship to the curriculum	General education courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), project-based, role-playing; Individualized approach: independent design		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 6 hours Teaching hours: 4 hours Self-study hours: 2 hours		
Credits	0.2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Innovation awareness and ability: Able to respond to the changing social environment, put forward innovative insights, and carry out innovative practices.	R12
	CLO2	Continuous learning ability: have lifelong learning awareness, independent learning ability and self-development potential, and be able to achieve in-depth expansion and horizontal transfer of knowledge and ability through continuous learning, and adapt to the sustainable development of society and individuals.	R12
content	Entrepreneurship education (1) is an enlightenment course in the		

	entrepreneurship curriculum system, which allows students to explain the basic concepts and functions of innovation and entrepreneurship, the process and elements of entrepreneurship, the connotation of entrepreneurship and the benefits of entrepreneurship to life development, stimulate students' awareness of innovation and entrepreneurship, and change students' views on entrepreneurship. It expounds the relationship between entrepreneurship and life development, so that students can understand and pay attention to the current situation and trend of employment and entrepreneurship in their majors, and let students pay attention to the development, employment and entrepreneurship of their majors, and have the ability to adapt and make breakthroughs in the face of an uncertain future. The teaching of this course is mainly to serve the "developmentable" link in the training goal of professional talents, and correspond to the "innovation awareness and ability" and "continuous learning ability" in the graduation requirements indicators. The course content includes: Chapter 1: The Connotation of Innovation and Entrepreneurship (Weight 1/4, Level: Memory, Understanding) Chapter 2: Key Elements and Basic Types of Entrepreneurship (Weight 1/4, Level: Memory, Understanding) Chapter 3: Entrepreneurship (weight 1/4, level: understanding, application) Chapter 4: Entrepreneurship and Life Development (Weight 1/4, Level: Understanding, Application)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 60% + final assessment × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. It mainly assesses students' independent learning, classroom performance, and after-school homework. (2) Final assessment, with a full score of 100 points, accounting for 40% of the overall evaluation score. The achievement of course knowledge, ability and literacy goals is mainly evaluated through the formal assessment of entrepreneurial project elaboration.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Entrepreneurship Basics, edited by Jiao Yanjun,Liu Wenfeng, Jin ling, Beijing: College of Electronic Science and Technology Press, January 2023. 2. Entrepreneurship Management, edited by Zhang Yuli, Machinery Industry Press, February 2015, 3rd edition. 3. How to Teach Entrepreneurship: The Practice-Based Babson Teaching

	Method, edited by Heidi M. Neck, Patricia G. Green, Candida G. Brush, Machinery Industry Press, April 2015, 1st edition. 4. Entrepreneurship Basics and Innovative Practice, edited by Cai Jian, Wu Ge, Wang Chenhuizi, Peking College Press, March 2015, 1st edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Entrepreneurship Education(2)

Module Name	Entrepreneurship Education(2)		
The semester in which this module is taught	Semester 4		
Module Leader	Golden spirit		
language	Chinese		
Relationship to the curriculum	General education courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), project-based, role-playing; Individualized approach: independent design		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 44 hours Teaching hours: 32 hours Self-study hours: 12 hours		
Credits	1.8 credits		
Prerequisites required and recommended for joining this module	Entrepreneurship education (1) and major-related courses		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through the setting of teaching situations, students can experience, understand, and master the knowledge content of entrepreneurial team formation, entrepreneurial thinking, design thinking, patent filling and application process, business model design, and business plan writing methods and theories in the teaching process.	R9、10、11
	CLO2	cultivate students' thinking and understanding of innovation and entrepreneurship; improve students' ability to connect theory with practice; Learn to use the relevant theoretical knowledge and skills of entrepreneurship to solve practical problems encountered in future entrepreneurship and business management.	R12

	CLO3	Cultivate students' good qualities of autonomy, initiative, creativity and independent thinking of problems, and dare to challenge authority, and gradually establish market development awareness based on this quality, and guide students to discover the market and grasp the business sensitivity of market opportunities.	R12
content	This course adopts a practice-based teaching method and relies on the entrepreneurial wisdom classroom to integrate the five modules of entrepreneurship education practice theory "task, empathy, creation, experimentation, and reflection" into the basic education of entrepreneurship. It is carried out in the form of flipped classroom teaching. The curriculum teaching has changed from the traditional classroom teaching method of "teacher one-man show, student passive learning" to "teacher guidance, teacher-student interaction, and students' independent learning". In each teaching period, teachers will focus on entrepreneurship education (2) based on the talent training plan, and teachers will let students experience entrepreneurship, understand and master the basic knowledge and skills of entrepreneurship through the design of games, Q&A, teacher-student interaction, simulation scenario teaching and other links. The course content includes: Module 1 Entrepreneurs and Entrepreneurial Teams (Weight 4/32, Level: Memory, Understanding, Application). Module 2 Design Thinking (weight 8/32, level: memory, understanding, application). Module 3 Marketing (weight 4/32, level: memory, understanding, application). Module 4 Enterprise simulation operation (weight 4/32, level: memory, understanding, application). Module 5 Business Model Design (Weight 4/32, Level: Memory, Understanding, Application). Module 6 Business Presentation (Weight 8/32, Level: Memory, Comprehension, Application, Evaluation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 60% + final assessment × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. It mainly assesses students' independent learning, classroom performance, phased tests, and after-school homework. (2) Final assessment, with a full score of 100 points, accounting for 40% of the overall evaluation score. The business plans of each group are mainly assessed and scored.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Design Thinking, edited by Jiao Yanjun, Zhao Rui, Duo Wenjuan, College of Electronic Science and Technology Press, June 2020. 2. Entrepreneurship Basics, edited by Yang Hongwei, Yang Jun, Jiao Yanjun, Jilin College Press, August 2017, 2nd edition. 3. Entrepreneurship Management, edited by Zhang Yuli, Machinery Industry Press, February 2015, 3rd edition. 4. How to Teach Entrepreneurship: The Practice-Based Babson Teaching Method, edited by Heidi M. Neck, Patricia G. Green, Candida G. Brush, Machinery Industry Press, April 2015, 1st edition. 5. Entrepreneurship Basics and Innovative Practice, edited by Cai Jian, Wu Ge, Wang Chenhuizi, Peking College Press, March 2015, 1st edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Computer Fundamentals (1)

Module Name	College Computer Fundamentals (1)		
The semester in which this module is taught	Semester 1		
Module Leader	Zuo Jihuai		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching, demonstration, and questioning; Interactive methods: inquiry-based problem learning, group discussion, cooperative learning method; Individualized learning methods: Feynman learning method, computer teaching Practical methods: task-driven method, practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 50 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 0.78 hours per week, a total of 18 weeks, 14 hours, including: after-school homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the basic and universal core concepts, methods and technologies in computer science, master the basic knowledge and basic skills of computers, cultivate students' computational thinking ability, improve students' information literacy, understand the role and value of information technology in the new era, and convey the scientific spirit.	R5
	CLO2	Familiar with the basic operation of office software, able to use office software to complete daily document processing, data processing and	R5

		information management tasks, and have good office software application ability.	
	CLO3	be able to use computers to obtain information, and will comprehensively use information technology to analyze specific problems and explore solutions to problems; Establish correct information values and morals, and establish the concept of lifelong learning.	R12
content	Through the study of this course, students can learn about common information retrieval tools and methods; Master the basic knowledge and basic operation skills of computers, be proficient in operating common office software, be able to use modern scientific and technological tools to analyze, process and display data information in related fields of majors, improve students' computer application ability and level, cultivate students' computational thinking ability and independent learning ability, and establish a sense of lifelong learning. Teaching content: Chapter 1 Basic Computer Knowledge (Weight 2/36, Level: Memory + Comprehension). Chapter 2 Computer System Knowledge (Weight 2/36, Level: Memory + Comprehension + Application). Chapter 3 Word processing software (weight 10/36, level: understanding + application). Chapter 4 Spreadsheet Software (Weight 12/36, Level: Understanding + Application). Chapter 5 Presentation Software (Weight 4/36, Level: Understanding + Application). Chapter 6 Computer Networks (Weight 2/36, Level: Memory + Understanding + Application). Chapter 7 First Acquaintance with Python (Weight 4/36, Level: Memory + Understanding).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, independent learning, homework, and completion of phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the form of computer-based tests, and the achievement of course objectives is evaluated.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Zhang Shujuan Zhou Yanping Editor-in-Chief. College Computer. Xi'an: Xi'an Jiaotong College Press, 2020.7. 2. Pu Yunwei, editor-in-chief. College Computer Computational Thinking and Network Literacy. Beijing: People's Posts and Telecommunications Publishing House, 2019.3. 3. Zhang Yongxin and Wang Tingzhong, editors-in-chief. Beijing: Tsinghua College Press, 2022.9.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

College Computer Fundamentals (2)

Module Name	College Computer Fundamentals (2).		
The semester in which this module is taught	Semester 1		
Module Leader	Zuo Jihuai		
language	Chinese		
Relationship to the curriculum	General education compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method, questioning; Interactive methods: inquiry-based problem learning, group discussion, cooperative learning method; Individualized learning methods: Feynman learning method, computer teaching Practical methods: task-driven method, practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 50 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 0.78 hours per week, a total of 18 weeks, 14 hours, including: after-school homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	College Computer Fundamentals (1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Be able to understand the basic concepts and methods of programming, be familiar with the syntax and basic concepts of Python, understand basic data structures, and master the use of Python's common standard libraries and third-party libraries. Understand AI-related concepts, working principles, and AI ethics issues, laying a foundation of knowledge for interdisciplinary practice.	R5
	CLO2	Familiar with the Python integrated development	R5

		environment, able to write programs in Python language to solve problems and process data information, able to use tools to read and analyze Python code, and have the ability to use AI tools to assist programming and apply computational thinking to solve complex problems.	
	CLO3	Students can develop a rigorous and responsible work attitude and scientific spirit, shape correct technical values and professional ethics, and strengthen ethical awareness and legal awareness.	R12
content	By studying this course, students can master the knowledge of Python language, understand programming ideas and programming techniques, and master the basic methods and processes of using computers to solve problems. Cultivate students' ability to write programs using basic knowledge of Python, enable students to effectively use programming methods to solve practical problems, and ultimately improve computational thinking, information technology application ability and artificial intelligence literacy. Teaching content: Chapter 1 Python Language Fundamentals (Weight 6/36, Level: Memory + Understanding + Application). Chapter 2 Basic Data Types (Weight 4/36, Level: Memory + Understanding + Application). Chapter 3 Program Control Structure (Weight 4/36, Level: Memory + Understanding + Application). Chapter 4 Function and Code Reuse (Weight 4/36, Level: Memory + Understanding + Application). Chapter 5 Combining Data Types (Weight 4/36, Level: Memory + Understanding + Application). Chapter 6 File and Data Formatting (Weight 4/36, Level: Memory + Comprehension + Application). Chapter 7 Programming Methods (Weight 4/36, Level: Memory + Understanding + Application). Chapter 8 Python Artificial Intelligence Basics (weight 6/36, level: memory + understanding + application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' classroom performance, homework, phased tests, and self-directed		

	learning completion. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through online assessment and the achievement of course objectives is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Song Tian, Huang Tianyu, Yang Yating. Fundamentals of Python Language Programming (3rd Edition). Beijing: Higher Education Press, 2024.09. 2. Gordon Editor-in-Chief. Python Fundamentals and Office Automation. Beijing: People's Posts and Telecommunications Publishing House, 2022.09. 3. Shen Yanguang and Xue Hongmei, editors-in-chief. College Computer - Python Programming. Beijing: Tsinghua College Press, 2021.09.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Advanced Mathematics (1)

Module Name	Advanced Mathematics (1)		
The semester in which this module is taught	Semester 1		
Module Leader	Zhu Meiling		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: heuristic teaching, case teaching, and teaching methods; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized approach: procedural teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 140 hours Teaching hours: 5 hours per week, 18 weeks in total, 90 hours Self-study hours: 2.77 hours per week, a total of 18 weeks, 50 hours, including: after-school homework, exam preparation time, etc		
Credits	5 credits		
Prerequisites required and recommended for joining this module	Elementary mathematics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the theoretical knowledge related to advanced mathematics required for electrical engineering and its automation majors;	R1
	CLO2	Use the advanced mathematical knowledge and methods learned to solve complex engineering problems in the field of electrical engineering through mathematical models.	R2
	CLO3	Develop a correct and rigorous learning attitude, good study habits and meticulous and serious calculation habits, independent learning and communication and cooperation skills, and have the ability to apply mathematical thinking to	R12

		study, work and live;	
content	By studying this course, students can systematically acquire the basic theoretical knowledge of calculus and ordinary differential equations, master the necessary basic theories and commonly used calculation methods, and be able to use the mathematical methods learned to solve practical problems in the field of electrical engineering. Through the study of each teaching link, students will have proficient computing ability, strong abstract thinking ability, logical reasoning ability, spatial imagination ability and self-learning ability, and the ability to analyze and solve practical problems. Teaching content: Chapter 1 Functions and Limits (Weight 22/90, Level: Memory, Understanding, Application). Chapter 2 Derivatives and Differentiation (Weight: 16/90, Level: Memory, Understanding, Application) Chapter 3 Differential Median Theorem and Application of Derivatives (weight 12/90, level: memory, understanding, application). Chapter 4 Indefinite Integral (Weight 14/90, Level: Memory, Understanding, Application) Chapter 5 Definite Integral (Weight 10/90, Level: Memory, Comprehension, Application) Chapter 6 Application of Definite Integrals (Weight: 6/90, Level: Memory, Understanding, Application) Chapter 7 Differential Equations (Weight 10/90, Level: Memory, Understanding, Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting for 50% of the overall evaluation score. (2) Final assessment, full score of 100 points, accounting for 0% of the overall evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] Advanced Mathematics (Volume I), edited by the School of Mathematical Sciences, Tongji College, Higher Education Press, published in July 2023. [2] "Advanced Mathematics (Volume I)", edited by the Higher Mathematics Textbook Writing Group of Northwestern Polytechnical College, Science Press, published in August 2024. [3] "Advanced Mathematics", edited by Tao Jinrui, Machinery Industry		

	Press, published in January 2021. [4] "Advanced Mathematics (Part I)", edited by Zhu Shixin and Tang Shuo, Higher Education Press, published in July 2020.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Advanced Mathematics (2)

Module Name	Advanced Mathematics (2)		
The semester in which this module is taught	Semester 2		
Module Leader	Zhu Meiling		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: heuristic teaching, case teaching, and teaching methods; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized approach: procedural teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 140 hours Teaching hours: 5 hours per week, 18 weeks in total, 90 hours Self-study hours: 2.77 hours per week, a total of 18 weeks, 50 hours, including: after-school homework, exam preparation time, etc		
Credits	5 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics (1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the theoretical knowledge of advanced mathematics (multivariate calculus, infinite series) required for electrical engineering and automation;	R1
	CLO2	Use the knowledge and methods of binary calculus and infinite series to solve problems in the field of electrical engineering through mathematical models;	R2
	CLO3	Develop a correct and rigorous learning attitude, good study habits and meticulous and serious calculation habits, independent learning and communication and cooperation skills, and have	R12

		the ability to apply mathematical thinking to study, work and live;	
content	By studying this course, students can systematically acquire the basic theoretical knowledge of multivariate calculus and infinite series, master the necessary basic theories and commonly used calculation methods, and be able to use the mathematical methods they have learned to solve practical problems in the field of electrical engineering. Through the study of each teaching link, students will have proficient computing ability, strong abstract thinking ability, logical reasoning ability, spatial imagination ability and self-learning ability, and the ability to analyze and solve practical problems. Teaching content: Chapter 8 Vector and Spatial Analytic Geometry (Weight 16/90, Level: Memory, Understanding, Application). Chapter 9 Multivariate Function Differentiation and Its Applications (Weight 20/90, Level: Memory, Understanding, Application). Chapter 10 Heavy Integral (Weight 14/90, Level: Memory, Understanding, Application). Chapter 11 Curve Integrals and Curved Area Fractions (weight 14/90, level: memory, understanding, application). Chapter 12 Infinite Series (weight 26/90, level: memory, understanding, application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting for 50% of the overall evaluation score. (2) Final assessment, full score of 100 points, accounting for 0% of the overall evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] Advanced Mathematics (II), edited by the School of Mathematical Sciences, Tongji College, Higher Education Press, June 2023, 8th edition. [2] "Advanced Mathematics (II)", Northwest College Advanced Mathematics Textbook Writing Group, Science Press, August 2021, 3rd edition. [3] "Advanced Mathematics (II)", edited by Bao Yong and Zhang Yanjun, Machinery Industry Press, January 2020, 1st edition. [4] "Advanced Mathematics (Part II)", edited by Fei Weiyin and Liang Yong, College of Science and Technology of China Press, January 2021, 3rd edition.		

Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

linear algebra

Module Name	linear algebra		
The semester in which this module is taught	Semester 2		
Module Leader	Zhang Dan		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: heuristic teaching, case teaching, and teaching methods; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized approach: procedural teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.66 hours per week, a total of 18 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics (1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the theoretical knowledge related to linear algebra required for electrical engineering and its automation majors;	R1
	CLO2	Use the knowledge and methods of linear algebra learned to solve related problems in the field of electrical engineering through mathematical models.	R2
	CLO3	Develop a correct and rigorous learning attitude, good study habits and meticulous and serious calculation habits, independent learning and communication and cooperation skills, and have the ability to apply mathematical thinking to	R12

		study, work and live;	
content	By studying this course, students can systematically acquire the basic concepts, basic theories and basic methods of determinants, matrices, linear equations, etc. in linear algebra; The properties of the determinant or the determinant will be used to calculate the determinant according to the expansion theorem of a certain row (column); proficient in matrix addition, subtraction, number multiplication and multiplication operations; It will use elementary row transformations to find the inverse of the matrix; Determine the situation of solving linear equations; Master the use of determinants, matrices, and vectors as tools to solve problems related to linear equations. Through the study of this course, students will cultivate their computing ability, data processing ability, abstract generalization ability and logical thinking ability, and lay the necessary mathematical knowledge foundation for learning subsequent courses and related professional applications. Teaching content: Chapter 1 Determinants (weight 12/54, level: memory, understanding, application) Chapter 2 Matrix (Weight 10/54, Level: Memory, Comprehension, Application) Chapter 3 Linear Equations (Weight 12/54, Level: Memory, Understanding, Application) Chapter 4 N-Dimensional Vector Space (Weight 6/54, Level: Memory, Understanding, Application) Eigenvalues and eigenvectors of the matrix (weight 8/54, level: memory, understanding, application) Chapter 6 Quadratic (Weight 6/54, Level: Memory, Understanding, Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting for 50% of the overall evaluation score. (2) Final assessment, full score of 100 points, accounting for 0% of the overall evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] "Linear Algebra", edited by Xiao Macheng, Higher Education Press, September 2021, 3rd edition. [2] "Linear Algebra", Wu Ganchang, Chinese College Press, June 2021,		

	5th edition. [3] "Linear Algebra", edited by Zhong Yuquan and Zhou Jian, published by Science Press, 2nd edition, January 2020.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Probability Theory and Mathematical Statistics

Module Name	Probability Theory and Mathematical Statistics		
The semester in which this module is taught	Semester 3		
Module Leader	Zhang Dan		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: heuristic teaching, case teaching, and teaching methods; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized approach: procedural teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.66 hours per week, a total of 18 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics (1), Advanced Mathematics (2), Linear Algebra		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the theoretical knowledge related to probability theory and mathematical statistics required for electrical engineering and automation;	R1
	CLO2	Use the knowledge and methods of probability theory and mathematical statistics to solve complex problems in the field of electrical engineering through mathematical models.	R2
	CLO3	Develop a correct and rigorous learning attitude, good study habits and meticulous and serious calculation habits, independent learning and communication and cooperation skills, and have	R12

		the ability to apply mathematical thinking to study, work and live;	
content	By studying this course, students can master the basic theoretical knowledge of probability theory and mathematical statistics and the calculation methods of various calculation problems, have the ability to understand, analyze and logical reasoning of relevant mathematical concepts, theorems and some conclusions, and be able to use the knowledge of probability statistics to solve practical problems in the field of electrical engineering. Teaching content: Chapter 1 Random Events and Probability (Weight 8/54, Level: Memory, Understanding, Application). Chapter 2 Random Variables and Their Distribution (Weight 10/54, Level: Memory, Understanding, Application) Chapter 3 Multidimensional Random Variables and Their Distribution (Weight 10/54, Level: Memory, Understanding, Application). Chapter 4 Numerical Characteristics of Random Variables (Weight 8/54, Level: Memory, Understanding, Application) Chapter 6 Samples and Sampling Distribution (Weight: 8/54, Level: Memory, Comprehension, Application) Chapter 9 Analysis of Variance and Regression Analysis (Weight: 10/54, Level: Memory, Understanding, Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting for 50% of the overall evaluation score. (2) Final assessment, full score of 100 points, accounting for 0% of the overall evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] "Probability Theory and Mathematical Statistics", edited by Sheng Su, Xie Shiqian and Pan Chengyi, Higher Education Press, December 2019, 5th edition. [2] "Tutorial on Probability Theory and Mathematical Statistics", edited by Shen Hengfan, Higher Education Press, fifth edition, June 2019. [3] "Course on Probability Theory and Mathematical Statistics", edited by Long Yonghong, Higher Education Press, published in December 2020.		
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS		

complex transform function and integral transformation

Module Name	complex transform function and integral transformation		
The semester in which this module is taught	Semester 3		
Module Leader	Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized approach: procedural teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-class experiments, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Higher Mathematics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Correctly understand the concepts of complex numbers, complex planes, complex functions, complex spheres and infinity points, and be proficient in the operation, properties and applications of complex numbers and complex functions. Understand the equivalence description	R1

		theorem of analytical functions, especially the Cauchy-Riemann condition, understand the analytical nature of elementary functions, as well as the infinity and differentiability of analytical functions, the isolation of the zero point of analytic functions, the uniqueness theorem of analytical functions, and the principle of maximum modulus.	
	CLO2	Be able to understand the definition of complex function integrals, be proficient in Cauchy integral theorem and its generalized forms, Cauchy integral formulas, mean theorem of analytic functions and their various applications; master the Taylor and Roland extensions of analytic functions, and be able to use them to solve practical problems; correctly understand the definition of retention and the retention theorem;	R2
	CLO3	Continuous learning ability, with lifelong learning awareness, independent learning ability and self-development potential, can achieve in-depth expansion and horizontal transfer of knowledge and ability through continuous learning, and adapt to the sustainable development of society and individuals;	R12
content	"Complex Functions and Integral Transformations" is a professional basic course offered by the undergraduate major of "Electrical Engineering and Its Automation". With the continuous development of science and technology, complex functions are used in more and more fields, such as electrical engineering, computer science, astronomy, physics, biology, engineering technology, etc., so complex functions are a very important and indispensable course for electrical engineering and its automation. Proficient in the basic theories and methods of complex transformation functions and integral transformations, and have a deep understanding of analytic functions, Cauchy integral theorem, Cauchy integral formulas, Taylor and Roland expansions of analytic functions, retention theory, etc., and can be used to solve simple practical problems. Teaching content:		

	Chapter 1 Complex and complex functions (weight 8/54, level: understanding + application). Chapter 2 Analytical Functions (Weight 6/54, Level: Understanding + Application). Chapter 3 Integrating complex functions (weight 8/54, level: understanding + application). Chapter 4 Series Representation of Complex Variable Functions (Weight 6/54, Level: Understanding + Application). Chapter 5 Retention and Its Application (Weight 6/54, Level: Understanding + Application). Chapter 6 Conformal Mapping (Weight 4/54, Level: Understanding + Application). Chapter 7 Fourier transform (weight 8/54, level: understanding + application). Chapter 8 Laplace Transform (weight 8/54, level: understanding + application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, classroom performance and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Li Hong, Xie Songfa. "Complex Variable Functions and Integral Transformations". Beijing: Higher Education Press, 2021. [2] Yu Jiarong. Complex Variable Functions, Fifth Edition. Beijing:

	Higher Education Press, 2014.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

College Physics

Module Name	College Physics		
The semester in which this module is taught	Semester 3		
Module Leader	Ji Zhiyong		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered methods: heuristic teaching, case teaching, and teaching methods; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 1.66 hours per week, a total of 18 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Higher Mathematics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the theoretical knowledge related to College physics required for electrical engineering and its automation majors; master and apply the ideas and methods of physics.	R1
	CLO2	Use the College physics knowledge and methods learned to analyze and solve problems in the field of electrical engineering through physical models.	R2
	CLO3	Develop a correct and rigorous learning attitude, good study habits, cultivate scientific literacy and attitude, and have the ability to apply physics thinking to study, work and live;	R12

content	Through this course, students can understand the structure, properties, interactions and basic laws of their motion of matter in nature, master the basic knowledge of electromagnetism, and initially have the ability to establish physical models, qualitative analysis and quantitative calculations, independently acquire knowledge, and connect theory with practice. Teaching content: Introduction (Weight 2/54, Level: Memory, Understanding, Application) Chapter 1 Electrostatic Fields (Weight 6/54, Level: Memory, Understanding, Application, Analysis) Chapter 2 Conductors and Electrolytes in Electrostatic Fields (weight 8/54, memory, understanding, application, analysis) Chapter 3 Direct Current (Weight 4/54, Level: Memory, Understanding, Application, Analysis) Chapter 4 Constant Magnetic Field (Weight 8/54, Level: Memory, Understanding, Application, Analysis) Chapter 5 Magnetic Media (Weight 6/54, Level: Memory, Understanding, Application, Analysis) Chapter 6 Electromagnetic Induction (Weight 6/54, Level: Memory, Understanding, Application, Analysis) Chapter 7 Alternating Current (Weight 10/54, Level: Memory, Understanding, Application, Analysis) Chapter 8 Maxwell's Theory of Electromagnetic Fields (Weight 4/54, Level: Memory, Understanding, Application, Analysis)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Chen Bingqian. General Course on College Physics. Electromagnetism (2nd ed.), Beijing: Peking College Press, 2012.1-371. [2] Zhang Ruiming. General Course on College Physics. Beijing: Peking College Press, 2016.10. [3] Zhang Sanhui. College Physics Electromagnetism (3rd Edition A Edition). Beijing: Tsinghua College Press, 2008.09-249. [4] Hu Haiyun. College Physics (Volume 3) Electromagnetism. Beijing: Higher Education Press, 2017.08-308.

Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

College Physics Experiment

Module Name	College Physics Experiment		
The semester in which this module is taught	Semester 3		
Module Leader	Ji Zhiyong		
language	Chinese		
Relationship to the curriculum	Basic compulsory courses for disciplines and majors		
Teaching methods	Teacher-centered approach: teaching method, heuristic/guided teaching, open-ended/inquiry-based, project-based learning; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized method: unit teaching, independent design		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week, a total of 10 weeks, 10 hours, including: pre-class preview, post-class writing of experimental report assignments.		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Higher Mathematics, College Physics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the theoretical knowledge and operational skills related to College physics experiments required for electrical engineering and its automation majors;	R1、R2
	CLO2	Use the College physics experimental knowledge, methods and skills learned to solve complex engineering problems in the field of electrical engineering through physical models.	R12
content	Through the teaching of College physics experiment courses, students can master the basic knowledge and methods of physics experiments, master the use of basic instruments, deepen their understanding of		

	physical phenomena and basic theoretical knowledge, and cultivate students' experimental ability and innovation ability. Teaching content: Item 1 RLC circuit characteristics (weight 4/18, level: memory, understanding, application, analysis) Item 2 Determination of photoelectric effects and Planck constants (weight 4/18, level: memory, understanding, application, analysis) Item 3 Frankhertz Experiment (Weight 1/18, Level: Memory, Understanding, Application, Analysis) Project 4 Wind power generation (weight 1/18, level: memory, understanding, application, analysis) Project 5 Autonomous Bridge Experiment (Weight 4/18, Level: Memory, Understanding, Application, Analysis) Item 6 Hall effect (weight 4/18, level: memory, understanding, application, analysis)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The achievement of curriculum knowledge objectives, ability goals and literacy goals is mainly evaluated through the evaluation of experimental reports.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Edited by the Physics Teaching and Research Group of Yunnan College of Economics and Management. College Physics Experiment Guide.2022. [2] Xie Bing, editor-in-chief. "College Physics Experiment". Xi'anXidian College Press. July 2021, 1st edition [3] Du Hongyan, editor-in-chief. "College Physics Experiment". Beijing. Science Press. August 2022, 1st edition [4] Fang Lili, Guo Peng, editors-in-chief. "College Physics Experiment". BeijingHigher Education Press. September 2020, 2nd edition.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Circuit theory (1).

Module Name	Circuit Theory (1)		
The semester in which this module is taught	Semester 1		
Module Leader	Zheng Yuli, Lu Xiaolei		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Higher Mathematics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	It can accurately reproduce the symbols, units and core characteristics of the basic components of the circuit (such as resistance, capacitance, and inductance), and list the mathematical expressions and applicable conditions of Kirchhoff's current law (KCL) and voltage law (KVL). Students can explain the physical meaning of Ohm's law, superposition theorem, Davinan's theorem, Norton's theorem, etc. in their own words, and compare the voltage and current distribution laws of series and parallel circuits, and explain their application differences in different scenarios.	**R1**
	CLO2	It can use the superposition theorem, node voltage method or network current method to solve the	**R2**

		voltage and current calculation problems of complex DC circuits, and design simple circuits to meet specific performance requirements. The transient response characteristics of the first-order dynamic circuit are explained by time domain and frequency domain analysis, and the key parameter relationships in the circuit are identified.	
	CLO3	It can design and implement corresponding circuit solutions based on actual needs.	**R12**
content	Circuit theory (1) is a compulsory course for electrical and electronics related majors, and it is also an introductory course for circuit analysis and design theory. The main task of this course is to study the basic theorems, laws, basic analysis methods and applications of circuits. Its purpose is to enable students to understand the basic concepts of circuits, master the basic knowledge of modern circuit theory, master its analysis methods, theorems and laws through the study of this course, and can flexibly apply them to circuit analysis, so that students can be cultivated and improved in the ability to analyze and solve problems, and lay a solid theoretical foundation for the in-depth study and application of subsequent courses. Teaching content: Chapter 1 Circuit Models and Circuit Laws (Weight 10/54, Level: Memory + Understanding + Application) Chapter 2 Equivalent Transformation of Resistive Circuits (Weight 10/54, Level: Understanding + Application) Chapter 3 General Analysis of Resistive Circuits (Weight 10/54, Level: Understanding + Application + Analysis) Chapter 4 Circuit Theorem (Weight 12/54, Level: Understanding + Application + Analysis) Chapter 5 Resistive circuits containing operational amplifiers (weight 6/54, level: understanding + application + analysis + creation) Chapter 6 Energy Storage Components (Weight 6/54, Level: Understanding + Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1Qiu Guanyuan, editor-in-chief. Higher Education Press, 2022. 2. Wang Jian, editor-in-chief. Principles of Circuits (Volume I).Tsinghua College Press, 2016. 3. Wang Jian, editor-in-chief. Principles of Circuits (Volume II).Tsinghua College Press, 2016. 4. Li Yuanqing, He Jia, editors-in-chief. Circuit Fundamentals and Practical Applications. China Electric Power Press, 2017.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Circuit theory (1) experiment

Module Name	Circuit theory (1) experiment		
The semester in which this module is taught	Semester 1		
Module Leader	Zheng Yuli, Lu Xiaolei		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized method: unit teaching, independent design Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: after-class experiments, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Circuit Theory (1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the characteristics and identification methods of basic circuit components; Understand the working principle of commonly used electrical instruments (oscilloscopes, signal sources, multimeters, etc.); Understand safety operating procedures and experimental precautions.	**R4**
	CLO2	be able to skillfully build various basic measurement circuits; standardize the use of instruments for voltage, current and other parameter measurement; analyze the differences between experimental data and theoretical calculations; Diagnose and troubleshoot simple circuit faults.	**R5**

	CLO3	be able to design innovative experimental schemes to verify circuit theory; Able to optimize existing experimental methods and measurement methods, evaluate the performance of different circuit schemes, and work as a team to complete comprehensive experimental projects, write standardized experimental reports and put forward improvement suggestions.	**R9**
content	"Circuit Theory (1) Experiment" is an important part of the teaching of circuit principles course, and is a separate professional basic course. The teaching task of this course is to verify theoretical knowledge, improve innovation ability, deepen the understanding of the knowledge learned, obtain the necessary perceptual understanding, and further consolidate the theoretical knowledge of circuits learned. Through experiments, learn the connection methods of basic circuits and the use of common electrical equipment and electrical instruments, cultivate the skills and skills of engaging in scientific experiments, improve students' ability to analyze and solve problems, and lay the foundation for learning follow-up courses and engaging in practical technology. Teaching content: Project 1 Understanding Experiment (Weight 2/18, Level: Memory + Comprehension + Application) Project 2 Verification of Ohm's Law and Calculation of Series and Parallel Resistance (Weight 2/18, Level: Memory + Understanding + Application) Project 3 Verification of Kirchhoff's Law (Weight 2/18, Level: Understanding + Application + Analysis) Item 4 Equivalent Transformation of Actual Voltage Source and Current Source (Weight 2/18, Level: Understanding + Application + Analysis) Project 5 Superposition Theorem (Weight 2/18, Level: Understanding + Application + Analysis) Project 6 Davidan Theorem (Weight 2/18, Level: Understanding + Application) Project 7 Understanding the simulation software Multisim (weight 2/18, level: application + analysis + evaluation) Project 8 Design of sine wave oscillation circuit based on operational amplifier (weight 4/18, level: application + analysis + evaluation + creation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' independent learning and experimental reports. (2) Final assessment, with a full score of 100 points, accounting for 60%		

	of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Wang Can, Wu Ping, editor-in-chief. Circuit experiment tutorial. Harbin Institute of Technology Press, 2020. 2. Gao Yan, editor-in-chief. Basic circuit experiment tutorial. Tsinghua College Press, 2014. 3. Liu Qingling, editor-in-chief. Circuit Basic Experiment Tutorial. Electronic Industry Press, 2016. 4. Zou Jianlong, Gao Xinyue and others. Circuit experiments. Higher Education Press, 2022.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Circuit theory (2).

Module Name	Circuit Theory(2)		
The semester in which this module is taught	Semester 2		
Module Leader	Zheng Yuli, Lu Xiaolei		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Circuit Theory (1)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the concept of dynamic components, understand the step response and impulse response calculation methods of first-order dynamic circuits; Understand the concept of phasor and the phasor representation method of sine quantity; Master the concept of series resonance and parallel resonance, memorize the structural form of three-phase circuit and the relationship between line voltage/phase voltage and line current/phase current.	**R1**
	CLO2	Proficient in the three-element method of first-order circuits, and can be applied to actual circuit analysis; Skillfully use phasor method to analyze sinusoidal steady-state circuits to solve	**R2**

		circuit calculation problems including coupling inductance; The frequency characteristics of the RLC series circuit were analyzed to complete the calculation of the symmetrical three-phase circuit.	
	CLO3	be able to evaluate various typical circuit problems and put forward optimization design ideas; Ability to design utility circuits and verify their feasibility.	**R12**
content	Circuit Theory (2) is a compulsory course for electrical and electronics-related majors, and it is also an introductory course for circuit analysis and design theory. The main task of this course is to study the basic theorems, laws, basic analysis methods and applications of circuits. Its purpose is to enable students to understand the basic concepts of circuits, master the basic knowledge of modern circuit theory, master its analysis methods, theorems and laws through the study of this course, and can flexibly apply them to circuit analysis, so that students can be cultivated and improved in the ability to analyze and solve problems, and lay a solid theoretical foundation for the in-depth study and application of subsequent courses. Teaching content: Chapter 1 Time Domain Analysis of First-Order and Second-Order Circuits (Weight: 10/54, Level: Understanding + Application) Chapter 2 Vector Method (Weight 8/54, Level: Understanding + Application) Chapter 3 Analysis of Sine Steady-State Circuits (Weight 12/54, Level: Understanding + Application + Analysis) Chapter 4 Circuits with Coupled Inductors (Weight 8/54, Level: Understanding + Application + Analysis) Chapter 5 Frequency Response of Circuits (Weight 4/54, Level: Understanding + Application + Analysis) Chapter 6 Three-phase circuit (weight 12/54, level: understanding + application + evaluation)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		

Read the list	1Qiu Guanyuan, editor-in-chief. Higher Education Press, 2022. 2. Wang Jian, editor-in-chief. Principles of Circuits (Volume I).Tsinghua College Press, 2016. 3. Wang Jian, editor-in-chief. Principles of Circuits (Volume II).Tsinghua College Press, 2016. 4. Li Yuanqing, He Jia, editors-in-chief. Circuit Fundamentals and Practical Applications. China Electric Power Press, 2017.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Circuit theory (2) experiment

Module Name	Circuit theory (2) experiment		
The semester in which this module is taught	Semester 2		
Module Leader	Zheng Yuli, Lu Xiaolei		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized method: unit teaching, independent design Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: after-class experiments, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Advanced mathematics, circuit theory (1), circuit theory (1) experiments		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the characteristics and identification methods of basic circuit components; Understand the working principles of commonly used electrical instruments (oscilloscopes, signal sources, multi-function AC meters, etc.); Understand safety operating procedures and experimental precautions.	**R4**
	CLO2	be able to skillfully build various basic measurement circuits; standardize the use of instruments to measure AC voltage, AC current, power and other parameters; analyze the differences between experimental data and theoretical calculations; Diagnose and	**R5**

		troubleshoot simple circuit faults.	
	CLO3	be able to design innovative experimental schemes to verify circuit theory; Able to optimize existing experimental methods and measurement methods, evaluate the performance of different circuit schemes, and work as a team to complete comprehensive experimental projects, write standardized experimental reports and put forward improvement suggestions.	**R9**
content	Circuit Theory (2) is a compulsory course for electrical and electronics-related majors, and it is also an introductory course for circuit analysis and design theory. The main task of this course is to study the basic theorems, laws, basic analysis methods and applications of circuits. Its purpose is to enable students to understand the basic concepts of circuits, master the basic knowledge of modern circuit theory, master its analysis methods, theorems and laws through the study of this course, and can flexibly apply them to circuit analysis, so that students can be cultivated and improved in the ability to analyze and solve problems, and lay a solid theoretical foundation for the in-depth study and application of subsequent courses. Teaching content: Project 1 Capacitance in AC Circuit (Weight 2/18, Level: Understanding + Application) Project 2 Inductors in AC Circuits (Weight 2/18, Level: Understanding + Application) Item 3 Measurement of each power in an AC circuit (weight 2/18, level: understanding + application + analysis) Item 4 Methods to Improve Power Factor (Weight 4/18, Level: Understanding + Application + Analysis) Project 5 Star connection of three-phase circuit load (weight 2/18, level: understanding + application + analysis) Item 6 Triangular connection of three-phase circuit load (weight 2/18, level: understanding + application) Project 7 Experimental Design of Response Test Simulation of RC First-Order Circuit Based on MultiSIM (Weight 4/18, Level: Application + Analysis + Evaluation + Creation)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' independent learning and experimental reports. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course		

	knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Wang Can, Wu Ping, editor-in-chief. Circuit experiment tutorial. Harbin Institute of Technology Press, 2020. 2. Gao Yan, editor-in-chief. Basic circuit experiment tutorial. Tsinghua College Press, 2014. 3. Liu Qingling, editor-in-chief. Circuit Basic Experiment Tutorial. Electronic Industry Press, 2016. 4. Zou Jianlong, Gao Xinyue and others. Circuit experiments. Higher Education Press, 2022.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Analog electronics technology basics

Module Name	Analog electronics technology basics		
The semester in which this module is taught	Semester 3		
Module Leader	Li Ping, Wang Lu		
language	Chinese		
Relationship to the curriculum	Compulsory courses for majors		
Teaching methods	Teacher-centered methods: lecture, demonstration, discussion, self-directed learning/blended method; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical method: course experiment		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 64 hours Teaching hours: 6 hours per week, 7 weeks in total, 42 hours Self-study hours: 3 hours per week (4 hours in the last week), a total of 7 weeks, 22 hours, including: pre-class preview, after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Circuit Theory (1), Circuit Theory (2)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the characteristics of semiconductor devices, the working principle and analysis methods of basic amplification circuits, so that students can initially master the general laws of reading and analyzing the schematics of analog circuits, and cultivate students' ability to use basic knowledge and mathematical model methods to analyze actual engineering problems in analog circuits.	**R1**
	CLO2	master the functions of each component of the integrated op amp; Master the analysis methods of analog operation circuits and signal processing circuits, be familiar with the role and influence of	**R2**

		negative feedback in circuits, train students to use the basic principles and performance of circuits to analyze complex engineering problems in analog circuits, and design practical research plans;	
	CLO3	master the structure and folding method of waveform generation circuit; Familiar with the composition and design method of DC regulated power supply, use simulation software to simulate and simulate electrical engineering problems, and cultivate students' ability to apply the basic knowledge of analog electronic technology and modern tools to analyze practical engineering problems in electrical engineering.	**R3**
content	Through the study of this course, students will master the basic concepts, basic circuits and basic analysis methods of analog electronic technology, and will use modern tools to simulate, design and analyze circuits, and gradually cultivate students' practical ability and comprehensive ability, so as to lay a solid foundation for the study and scientific research of subsequent professional courses. Teaching content: Chapter 1 Commonly Used Semiconductor Devices (Weight 6/42, Level: Memory-Application) Chapter 2 Basic Amplification Circuits (Weight 6/42, Level: Memory-Analysis) Chapter 3 Integrated Operation Amplification Circuit (Weight 4/42, Level: Memory-Analysis) Chapter 4 Amplification of Frequency Response of Circuits (Weight 4/42, Level: Memory + Understanding + Evaluation) Chapter 5 Signal Operation and Processing (Weight 4/42, Level: Memory + Understanding + Evaluation) Chapter 6 Amplifying Feedback in Circuits (Weight 6/42, Level: Memory + Comprehension + Evaluation) Chapter 7 Signal Operation and Processing (Weight 4/42, Level: Memory + Comprehension + Evaluation) Chapter 8 Power Amplification Circuits (Weight 4/42, Level: Memory-Analysis) Chapter 9 DC Power Supply (Weight 4/42, Level: Memory-Analysis)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in		

	the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Fundamentals of Analog Electronic Technology (Fifth Edition)", edited by Tong Shibai, Higher Education Press, published in 2021. 2. "Concise Tutorial on the Basics of Analog Electronic Technology", edited by Yang Suxing, Higher Education Press, published in 2019. 3. "Fundamentals of Electronic Technology (Analog Part)", Higher Education Press, published in 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Basic experiments of analog electronic technology

Module Name	Basic experiments of analog electronic technology		
The semester in which this module is taught	Semester 3		
Module Leader	Li Ping, Wang Lu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Practical method: course experiment		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: pre-class preview, after-class homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Circuit Theory (1) Experiment, Circuit Theory (2) Experiment		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the use of common electronic devices, understand the basic structure and working principle of the common emitter single tube amplification circuit, the significance of setting static working points, and simplify the small signal model. Master the estimation of voltage magnification, source voltage magnification, input resistance, and output resistance. Understand the characteristics and applications of emitter outputs, and understand the analysis methods of dynamic parameters of multi-level amplification	R4

	circuits. Understand the characteristics of Class B complementary symmetric power amplification circuits, Class A and B complementary symmetric power amplification circuits, master the characteristics of composite tubes, master the maximum output power, efficiency calculation and selection of amplifier tubes of OTL and OCL circuits; Understand the composition and working principle of differential amplification circuits, and master the analysis methods of static and dynamic parameters. understand the composition of a typical integrated op amp and the characteristics of its parts; mastering op-amps and their applications; Understand the concept of feedback and the classification of negative feedback amplifiers; master the judgment of feedback type and the influence of negative feedback on the performance of amplification circuits; Understand the analysis methods of active filters and understand the working characteristics of first-order active filters. Understand the composition and working principle of the voltage comparator circuit; master the working principle of voltage regulated power supply;	
CLO2	master the characteristics of electrical instruments and components in commonly used analog electronic technology, and be able to correctly measure various electrical parameters (such as voltage, current and electrical power, etc.); Learn to rationally select measuring instruments (types, accuracy and range, etc.) and measurement methods in experiments; learn to troubleshoot some common faults in experiments; deepen the theoretical knowledge of analog electronic technology, cultivate the ability to use basic theoretical analysis, deal with experimental problems and design simple circuits; By writing experimental reports, cultivate data analysis skills, text organization skills, and ability to process experimental results (such as error analysis of experimental data, curve fitting, etc.);	R5

	CLO3	Cultivate students' rigorous scientific style, establish the point of view of linking theory with practice, and improve the ability of scientific experimentation and innovation.	R9
content	Through the experimental teaching of analog electronic technology, students can fully master the principles and basic experimental skills of various amplification circuit analysis methods. The ability to analyze and solve problems in conventional circuit systems by practical means. Cultivate students' basic ability to use simulation tools such as multisim to amplify circuit system analysis, design, simulation experiments and debugging, cultivate students' rigorous scientific style, establish the point of view of linking theory with practice, improve the ability of scientific experiment and innovation, and lay the necessary foundation for further learning follow-up professional knowledge and solving practical engineering problems. Teaching content: Item 1 Setting of the static working point of the triode (weight 2/18, level: understanding-evaluation). Project 2 co-emission amplification circuit (weight 2/18, level: understanding-evaluation). Item 3 Inverted proportional amplification circuit (weight 2/18, level: understanding-evaluation). Item 4 Integral operation circuit (weight 2/18, level: understanding-evaluation). Item 5 JK Trigger (Weight 2/18, Level: Understanding-Evaluation). Item 6 Additive operation circuit (weight 2/18, level: understanding-evaluation). Item 7 Single-limit comparison circuit (weight 2/18, level: understanding-evaluation). Item 8 Output adjustable voltage regulation circuit (weight 2/18, level: understanding-evaluation). Project 9 Design of automatic alarm for anti-theft disconnection (weight 2/18, level: understanding-evaluation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through experimental reports, and the achievement of curriculum knowledge objectives, ability objectives and literacy goals is evaluated.		
Study and exam	The evaluation is based on a 100-point system, and 60 points are the		

requirements	passing score for this course
Read the list	Self-compiled experimental instructions and experimental reports
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Fundamentals of digital electronic technology

Module Name	Fundamentals of digital electronic technology		
The semester in which this module is taught	Semester 3		
Module Leader	Li Ping, Wang Lu		
language	Chinese		
Relationship to the curriculum	Discipline and professional basic courses		
Teaching methods	Teacher-centered methods: lecture, demonstration, discussion, self-directed learning/blended method; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical method: course experiment		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 64 hours Teaching hours: 6 hours per week, 7 weeks in total, 42 hours Self-study hours: 3 hours per week (4 hours in the last week), a total of 7 weeks, 22 hours, including: pre-class preview, after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, College Physics, Circuit Theory (1), Circuit Theory (2), Fundamentals of Analog Electronics Technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	understand various number systems, master the use of various representation methods to describe the logic functions of digital circuits; Ability to analyze the logic function of digital logic circuits; be able to complete the design of simple digital logic circuits according to practical problems; be able to understand the logic functions and usage methods of digital integrated circuits through reading the data of digital integrated circuit chips;	R1
	CLO2	have the ability to preliminarily analyze and	R2

		troubleshoot faults in digital logic circuits; Have the ability to draw the electrical schematic diagram of the designed digital logic circuit, list the components of the designed circuit, and write the test instructions of the designed circuit. Have a certain ability to identify and judge the key links and parameters of electronic technical problems; Proficient in using commonly used instruments in digital circuits; have certain logical thinking skills and the ability to analyze and solve problems; have the ability to learn continuously and independently to achieve sustainable development; have teamwork ability and give full play to subjective initiative;	
	CLO3	cultivate students' serious scientific style; cultivate students' teamwork spirit; cultivate students to apply what they have learned and think independently; cultivate students' critical spirit, encourage students to pursue truth, and stimulate students to pursue innovation; Cultivate students' professional ethics, professionalism and social responsibility.	R3
content	Through the study of this course, students are trained to analyze and design digital electronic circuits, and then comprehensively improve students' ability to apply electronic circuits, and this course also provides a professional foundation for the study of subsequent courses. Teaching content: Chapter 1 Number System and Code System (weight 4/42, level: memory + comprehension). Chapter 2 Fundamentals of Logical Algebra (weight 6/42, level: memory-comprehension). Chapter 3 Gate Circuit (Weight 6/42, Level: Memory-Analysis). Chapter 4 Combinatorial logic circuits (weight 8/42, level: memory-analysis). Chapter 5 Semiconductor Memory Circuits (Weight 4/42, Level: Memory-Analysis). Chapter 6 Timing Logic Circuits (Weight 6/42, Level: Memory-Analysis). Chapter 7 Generation and Shaping of Pulse Waveforms (Weight 4/42, Level: Memory-Analysis). Chapter 8 Digital-Analog and Analog-Number Conversion (Weight 4/42, Level: Memory-Analysis).		
Assessment form	1. The course assessment consists of process assessment and final		

	assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Fundamentals of Digital Electronic Technology (Sixth Edition), edited by Yan Shi, Higher Education Press, published in 2021. 2. "Concise Tutorial on the Basics of Digital Electronic Technology (4th Edition)", edited by Yu Mengchang, Higher Education Press, published in 2021. 3. "Concise Tutorial on the Basics of Digital Electronic Technology (6th Edition)", edited by Kang Huaguang, Higher Education Press, published in 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Basic experiment of digital electronic technology

Module Name	Basic experiment of digital electronic technology		
The semester in which this module is taught	Semester 3		
Module Leader	Li Ping, Wang Lu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Practical method: course experiment		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: pre-class preview, after-class homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Advanced Mathematics, College Physics, Circuit Fundamentals, Analog Electronic Technology Fundamentals		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	understand various number systems, master the use of various representation methods to describe the logic functions of digital circuits; Ability to analyze the logic function of digital logic circuits; be able to complete the design of simple digital logic circuits according to practical problems; be able to understand the logic functions and usage methods of digital integrated circuits through reading the data of digital integrated circuit chips;	R4
	CLO2	have the ability to preliminarily analyze and troubleshoot faults in digital logic circuits; Have	R5

		the ability to draw the electrical schematic diagram of the designed digital logic circuit, list the components of the designed circuit, and write the test instructions of the designed circuit. Have a certain ability to identify and judge the key links and parameters of electronic technical problems; Proficient in using commonly used instruments in digital circuits; have certain logical thinking skills and the ability to analyze and solve problems; have the ability to learn continuously and independently to achieve sustainable development; have teamwork ability and give full play to subjective initiative;	
	CLO3	cultivate students' serious scientific style; cultivate students' teamwork spirit; cultivate students to apply what they have learned and think independently; cultivate students' critical spirit, encourage students to pursue truth, and stimulate students to pursue innovation; Cultivate students' professional ethics, professionalism and social responsibility.	R9
content	Through the study of this course, students are trained to analyze and design digital electronic circuits, and then comprehensively improve students' ability to apply electronic circuits, and this course also provides a professional foundation for the study of subsequent courses. Teaching content: Item 1 TTL non-gate (weight 2/18, level: understanding-evaluation). Item 2 Full adder (weight 2/18, level: understanding-evaluation). Item 3 Priority encoder (weight 2/18, level: understanding-evaluation). Item 4 Display decoder (weight 2/18, level: understanding-evaluation). Item 5 JK Trigger (Weight 2/18, Level: Understanding-Evaluation). Item 6 Registers (weight 2/18, level: understanding-evaluation). Item 7 Binary counter (weight 2/18, level: understanding-evaluation). Item 8 Decimal counter (weight 2/18, level: comprehension-evaluation). Item 9 Accumulator design within 1000 (weight 2/18, level: understanding-evaluation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting		

	for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of curriculum knowledge objectives, ability objectives and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Self-compiled experimental instructions and experimental reports
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Engineering drawing

Module Name	Engineering drawing		
The semester in which this module is taught	Semester 1		
Module Leader	Yang Lin, Qiao Lin		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interaction method: project-based problem learning Individualized method: unit teaching, independent design Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 56 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 2 hours per week, a total of 10 weeks, 20 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Implement relevant national standards, be familiar with the relevant basic knowledge in national standards, and master the use of drawing instruments; Master the methods of drawing assembly views, reading assembly views, and assemblage dimensioning, and strengthen the training of spatial conception, drawing analysis, and dimensioning of object shapes through surveying, drawing, and reading drawings, so as to improve students' image thinking ability and ability to read pictures. master the expression methods of view, section view, and section, and	R1

		be familiar with commonly used simplified drawing methods; Master the reading method of electrical engineering drawings.	
	CLO2	apply the basic principles of orthographic projection to cultivate the ability to draw and read engineering drawings; enable students to master the methods of drawing sketches with their bare hands and drawing with instruments; Further cultivate spatial imagination and creative thinking ability.	R3
	CLO3	Cultivate a serious and responsible work attitude and a rigorous and meticulous work style.	R8
content	Engineering drawings are known as the language of the engineering community, which is an important tool for expressing and communicating technical ideas and an important technical document of the engineering and technical department. This course cultivates students' image thinking ability, engineering design ability and computer drawing ability by studying the principles and methods of drawing and reading engineering drawings; It is a professional and technical basic course with both systematic theory and strong practicality. Teaching content: Chapter 1 Basic Knowledge and Basic Skills of Drawing (Weight 10/36, Level: Memory + Understanding + Application) Chapter 2 Projection of Points, Lines and Planes (Weight 4/36, Level: Memory + Comprehension + Application) Chapter 3 Three-dimensional projection (weight 6/36, level: memory + understanding + application) Chapter 4 View and Dimension Annotation of Assemblies (Weight 8/36, Level: Memory + Understanding + Application) Chapter 5 Axonometric Diagram (Weight 2/36, Level: Memory + Understanding + Application) Chapter 6 Basic Representation Method of Machine Shape (Weight 4/36, Level: Memory + Understanding + Application) Chapter 7 Basic Knowledge of Electrical Engineering Drawings (2/36, Level: Memory + Understanding + Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60%		

	of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Tang Kezhong, editor-in-chief. Drawing Geometry and Engineering Drawing. Higher Education Press, 2021. 2. Zhang Yinglong, editor-in-chief. Electrical engineering drawing and drawing. Chemical Industry Press, 2020. 3. Ge Yanhong, editor-in-chief. Drawing geometry and mechanical drawing. Tsinghua College Press, 2019.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Engineering electromagnetic field

Module Name	Engineering electromagnetic field		
The semester in which this module is taught	Semester 4		
Module Leader	Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: simulation experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 56 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 2 hours per week, a total of 10 weeks, 20 hours, including: after-class homework, pre-class preview, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Linear Algebra, Complex Functions, College Physics		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand important physical quantities: electric field strength, magnetic induction strength, magnetic field strength and other physical meanings, and deeply understand the important properties and laws of electromagnetic fields; It can apply Gaussian theorem and Ampere loop law to calculate simple fields, and can	R1

		qualitatively describe the approximate distribution of fields. Understand the distribution and transmission of electromagnetic field energy, and can simply calculate the electric field force and magnetic field force by the virtual displacement method; Understand the calculation of capacitance and capacitance, understand the capacitance of double transmission lines, understand the electric field energy and its distribution of live conductor systems, and calculate the ground resistance.	
	CLO2	Cultivate students' practical perspectives The preliminary ability to qualitatively analyze and judge electromagnetic phenomena and electromagnetic processes in electrical engineering, as well as the basic skills of quantitative analysis, lay the foundation for further learning and application of various complex electromagnetic field calculation methods.	R2
	CLO3	Through the logical reasoning of electromagnetic field theory, students should cultivate correct thinking methods and rigorous scientific attitudes.	R12
content	Engineering electromagnetic field is one of the basic courses of electrical engineering and automation. The purpose of this course is to allow students to master the basic laws, basic principles and basic analysis methods of macroscopic electromagnetic fields as a whole, understand the expression and numerical calculation methods of electromagnetic field edge value problems, understand the application of electromagnetic field concepts and methods in electrical engineering, and lay a good foundation for the study and solution of engineering electromagnetic field problems in subsequent courses. Teaching content: Chapter 1 Fundamentals of Vector Analysis and Field Theory (Weight 6/36, Level: Memory + Understanding + Application). Chapter 2 Basic principles of electrostatic field (weight 10/36, level:		

	memory + understanding + application). Chapter 3 Basic Principles of Constant Electric Field (Weight 2/36, Level: Memory + Understanding + Application). Chapter 4 Basic Principles of Constant Magnetic Field (Weight 8/36, Level: Memory + Understanding + Application). Chapter 5 Basic Principles of Time-Varying Electromagnetic Fields (Weight 6/36, Level: Memory + Understanding + Application). Chapter 6 Electromagnetic Field Problems in Electrical Engineering (Weight 4/36, Level: Understanding + Analysis + Evaluation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1.Wang Zezhong and Quan Yusheng, eds. Engineering Electromagnetic Field (3rd Edition). Tsinghua College Press, 2021. 2. Zhang Huijuan, Lü Dianli and others. Engineering electromagnetic field. Machinery Industry Press, 2022. 3. Ni Guangzheng, editor-in-chief. Principle of Engineering Electromagnetic Field. Higher Education Press, 2016.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Automatic control theory

Module Name	Automatic control theory		
The semester in which this module is taught	Semester 5		
Module Leader	Lu Xiaolei, Yang Yu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced mathematics, linear algebra, complex functions, circuit theory		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the basic concepts of automatic control, the composition of control systems and the basic requirements for control systems, and master the methods of establishing mathematical models of systems with transfer functions, square diagrams, signal flow diagrams and state space descriptions. Understand the performance requirements of automatic control systems and methods for analyzing system performance, learn control system analysis methods such as time domain analysis, frequency domain analysis, and root trajectory method in classical control theory, and master the steps of applying system analysis methods for control system correction and	R1

		design.	
	CLO2	Apply the basic principles and analysis and correction methods of classical control theory to cultivate the ability to analyze and correct the system. Students can use corresponding analysis methods according to the actual system parameters, draw approximate root trajectories and draw Byrd diagrams to analyze and correct the system according to the corresponding time domain. Cultivate students to truly understand and master the methodology of thinking, analysis and problem-solving of classical control theory, and further cultivate the ability of dialectical logical thinking.	R2
	CLO3	Through the study of control theory, we can experience the role of each link in the control system, correctly understand the relationship between personal needs and social needs, and correct world view, outlook on life and values.	R4
content	The automatic control theory course is an important discipline of electrical engineering and its automation. The main task of this course is to enable students to understand the composition, characteristics and professional terminology of automatic control systems, learn and master the analysis and correction methods of classical control theory such as time domain analysis, root trajectory, and frequency domain analysis, and have the ability to apply the knowledge learned to analyze and correct the control system. Lay a solid theoretical foundation for the subsequent study of theoretical courses and professional courses. Teaching content: Chapter 1 General Concepts of Automatic Control (Weight 654, Level: Memory + Understanding + Application). Chapter 2 Mathematical model of control system (weight 10/54, level: memory + understanding + application). Chapter 3 Time domain analysis method of linear system (weight 10/54, level: memory + understanding + application). Chapter 4 Root Trajectory Method of Linear Systems (Weight 10/54, Level: Memory + Understanding + Application). Chapter 5 Frequency domain analysis method of linear system (weight 10/54, level: memory + understanding + application). Chapter 6 Correction Methods for Linear Systems (Weight 8/54, Level: Memory + Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process		

	assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Hu Shousong, editor-in-chief. Basic Tutorial on Principles of Automatic Control (5th Edition) Science Press, 2023. 2. Hu Shousong, editor-in-chief. Principles of Automatic Control (7th Edition). Science Press, 2018. 3. Gene F. Franklin, editor-in-chief. Principle and Design of Automatic Control (Eighth Edition).Electronic Industry Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Theoretical experiment of automatic control

Module Name	Theoretical experiment of automatic control		
The semester in which this module is taught	Semester 5		
Module Leader	Lu Xiaolei, Yang Yu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized method: unit teaching, independent design Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: after-class experiments, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Advanced mathematics, linear algebra, complex functions, circuit theory		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through the teaching of automatic control theory experiments, students can apply MATLAB/Simulink simulation to verify the theoretical knowledge they have learned, analyze and study the control system, deepen their understanding of the knowledge they have learned, obtain the necessary perceptual	R4

		understanding, and consolidate the theoretical knowledge of automatic control.	
	CLO2	Through experiments, master the simulation methods and steps of the control system MATLAB/simulink , be able to program and build simulation models for the given control system, complete the analysis and correction of the system, improve students' ability to analyze and solve problems, and lay the foundation for continuing courses and engaging in practical technology after learning.	R4
	CLO3	Through experiments, master the collection and analysis methods of experimental data and draw the system curves such as time domain analysis, root trajectory, and frequency response of the control system, which lays the foundation for the analysis and design of the power system in the future.	R5
content	"Automatic Control Theory Experiment" is an important part of the teaching of automatic control theory. The teaching task of this course is to enable students to master the ability to apply Matlab/Simulink to control system programming through the teaching of automatic control theory, and to strengthen students' understanding of what they have learned through computer analysis experiments, but also to improve students' ability to apply relevant computer software. Verify the theoretical knowledge learned, deepen the understanding and mastery of theoretical knowledge, cultivate the general methods of process and simulation, have the skills and skills of applying computer programming and simulation to analyze and correct scientific experiments, improve students' ability to analyze and solve problems, and lay the foundation for continuing courses and engaging in practical technology after learning. Teaching content: Project 1 MATLAB Understanding Experiment (Weight 2/18, Level: Understanding + Application). Project 2 MATLAB mathematical model experiment for control system (weight 2/18, level: understanding + application).		

	Project 3 MATLAB System Model Conversion and Connection Experiment (Weight 2/18, Level: Understanding + Application). Project 4 MATLAB to find the corresponding experiment in the time domain (weight 2/18, level: understanding + application). Item 5 MATLAB Stability Analysis (Weight 2/18, Level: Understanding + Application). Project 6 MATLAB Root Trajectory Experiment for Mapping System (Weight 2/18, Level: Understanding + Application). Project 7 MATLAB frequency domain analysis experiment (weight 2/18, level: understanding + application). Project 8 Control system calibration and analysis experiment (weight 4/18, level: understanding + application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' experimental reports and independent learning. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Wang Zhenglin, Wang Shengkai, Chen Guoshun, Wang Qi (eds.).MATLAB/Simulink and Control System Simulation (4th Edition).Electronic Industry Press, 2020. 2. Yan Gangfeng, editor-in-chiefMATLAB/Simulink and Control System Simulation and Application. Tsinghua College Press, 2022. 3. Jiang Zengru, editor-in-chief. Control System Modeling and Simulation. Tsinghua College Press, 2020.
Version number	V2022, the major version will take effect in September 2022

	V2022.1, Update point: Credits and workload are calculated according to ECTS

Power electronics technology

Module Name	Power electronics technology		
The semester in which this module is taught	Semester 3		
Module Leader	Wang Jiachen, Li Ping, Chen Shuliang		
language	Chinese		
Relationship to the curriculum	Compulsory courses for majors		
Teaching methods	Teacher-centered approach: teaching, inquiry, discussion; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Methods of practice: project practice;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 3 hours per week, a total of 10 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Power electronic devices, rectifier circuits, chopper circuits, inverter circuits, PWM control technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Familiar with the characteristics and usage methods of various power electronic devices; master the structure, working principle, control method and basic quantity relationship of various power electronic circuits; Familiar with the application scope and technical and economic indicators of various power electronic devices;	R2、R3
	CLO2	Enable students to use the basic knowledge and scientific methods of power electronics technology to analyze the action of key parameters in the electrical system and propose solutions to complex engineering problems. be able to design power electronic circuits and	R9

		calculate power electronic circuit parameters and indicators;	
	CLO3	Enable students to learn to communicate with others, learn to cooperate, and correctly handle the relationship between individuals and teams.	R11、R12
content	"Power Electronics Technology" is a professional core course of electrical engineering and automation, which is a combination of theory and application, and is a highly practical course. It includes power electronic devices, AC-DC controllable rectifier circuits, DC-DC (DC-DC) chopping circuits, DC-AC (DC-AC) inverter circuits, AC-AC conversion circuits and PWM control technology. This programme focuses on developing students' problem-solving skills, laying the foundation for subsequent courses such as "Automatic Devices for Power Systems" and engaging in technical work and scientific research related to electrical engineering. Teaching content: Chapter 1 Power Electronic Devices (Weight 8/54, Level: Understanding). Chapter 2 Rectifier Circuits (Weight 14/54, Level: Knowledge - Analysis). Chapter 3 DC Chopper Circuit (Weight 10/54, Level: Knowledge - Analysis). Chapter 4 Inverter Circuits (Weight 14/54, Level: Knowledge - Analysis). Chapter 5 PWM Control Technology (Weight 8/54, Level: Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	1. "Power Electronics Technology", edited by Wang Zhaoan and Liu Jinjun, published by Machinery Industry Press in 2022. 2. "Power Electronics Technology", edited by Kang Jinsong and Tao Shenggui, China Railway Press, published in 2019.		
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS		

Power electronics technology experiments

Module Name	Power electronics technology experiments		
The semester in which this module is taught	Semester 3		
Module Leader	Wang Jiachen, Li Ping, Chen Shuliang		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Methods of practice: project practice;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 2 hours per week, a total of 5 weeks, 10 hours, including: after-school homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Power electronics technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through this course, students can further master the principles and basic quantitative relationships of rectifier circuits, chopping circuits, inverter circuits, and PWM control technology.	R4
	CLO2	Through this course, students can choose research routes and design feasible experimental schemes based on research objectives and object characteristics. Enable students to have the ability to combine theory and practice, correctly select experimental equipment, carry out experiments safely, and analyze experimental data effectively and correctly;	R5

	CLO3	Through this course, students will have the quality of professional ethics and norms that abide by honesty, fairness and code.	R8
content	The power electronics technology experimental course is an important practical course for electrical engineering and automation. Through the study of this course, students can understand the working mechanism, electrical characteristics and main parameters of commonly used power electronic devices. Understand and master the basic working principle, circuit structure, electrical performance, waveform analysis method and parameter calculation of basic power electronic circuits from practice, so that students have a certain ability to experiment and debug power electronic circuits, and achieve the purpose of assisting teaching, enhancing perceptual understanding, and improving students' analysis and problem-solving ability. Experimental content: Experiment 1 Sawtooth wave synchronous phase-shifting trigger circuit experiment (weight 2/18, level: application). Experiment 2: Single-phase bridge fully controlled rectifier circuit experiment (weight 2/18, level: application). Experiment 3 Three-phase bridge fully controlled rectification and active inverter circuit experiment (weight 3/18, level: application). Experiment 4: DC chopper circuit experimental weight (3/18, level: application). Experiment 5: Design of photovoltaic grid-connected power generation simulation device (weight 8/18, level: creation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' experimental preparation, experimental process, and experimental results. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through skill tests, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	"Power Electronics Technology Experimental Guidebook", edited by the Electrical Teaching and Research Office of Yunnan College of Economics and Management, compiled in 2022.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Electrical Engineering

Module Name	Electrical Engineering		
The semester in which this module is taught	Semester 4		
Module Leader	Chen Shuliang, Cao Zhe		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Engineering electromagnetic field and circuit theory		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the basic physical quantities of magnetic fields and the basic laws of magnetic circuits, and understand commonly used electromagnetic materials and their characteristics; Have a certain understanding of the basic structure of transformers and three main motors (DC motor, induction motor and synchronous motor); Understand the connection rules of DC single-stack, single-wave winding and AC three-phase single-layer and double-layer integer groove windings. Deeply understand the properties of the magnetic dynamic potential and air gap magnetic field of the stator and rotor of the three main motors, as well as the relationship between time and space. Master the working principle of transformers and various motors, the	R1

		magnetic field distribution during normal and stable operation, the analysis methods and theories used, and the performance during steady-state operation; Correctly establish voltage equations and torque equations, and clarify the conversion power, electromagnetic power and their relationship with electromagnetic rotation distance in the motor; There should be a clear physical concept of the parameters of the motor during steady-state operation; Basic understanding of the energy relationship in the motor, the electromechanical energy conversion process, as well as the energy conversion and the conditions for obtaining constant electromagnetic torque.	
	CLO2	Through careful study and solving exercises, gradually integrate the knowledge learned, and initially have the ability to analyze and solve practical problems; Master the basic motor electric dragging method and its working principle, such as forward and reverse rotation of three-phase induction motor, star triangle start, DC motor starting, forward and reverse rotation, speed regulation and braking, etc.; Continuous learning ability: have lifelong learning awareness, independent learning ability and self-development potential, and be able to achieve in-depth expansion and horizontal transfer of knowledge and ability through continuous learning, and adapt to the sustainable development of society and individuals.	R2
	CLO3	Discipline; have good integrity, professionalism, sense of responsibility, social morality and professional ethics; It has a high level of cultural accomplishment, strong aesthetic ability and noble moral sentiments, and has a rigorous and scientific way of thinking and truth-seeking spirit.	R3
content	Electrical engineering is an important core course of electrical engineering and automation, and it is a course offered before the professional course. The teaching purpose is to enable students to fully grasp the basic structure and operating principles of transformers, synchronous machines, asynchronous machines, and DC machines after learning this course. Proficient in the basic theory of electromagnetism and its analysis methods of the "four major motors", and be able to effectively use tools such as equation systems, equivalent circuits and phasor diagrams to analyze and solve practical problems related to electrical engineering. Master some basic knowledge of motor control to facilitate the study of subsequent professional courses.		

	Teaching content: Chapter 1 Magnetic Circuit (Weight 4/54, Level: Memory + Understanding + Application). Chapter 2 Transformers (weight 18/54, level: memory + understanding + application). Chapter 3 AC Winding (Weight 4/54, Level: Memory + Understanding + Application). Chapter 4 Induction Motor (Weight 12/54, Level: Memory + Understanding + Application). Chapter 5 Synchronous Motor (Weight 12/54, Level: Memory + Understanding + Application). Chapter 6 DC Motor (Weight 4/54, Level: Memory + Understanding + Application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Gu Chenglin, Chen Qiaofu, Xiong Yongqian, et al., eds. Electrical Engineering. Huazhong College of Science and Technology Press, 2018. [2] Liu Huijuan, Wang Yaxin and others. Electrical Engineering. Mechanical Education Press, 2021. [3] Tang Yunqiu, ed. Electrical Engineering. Mechanical Education Press 2014.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Electrical Engineering Experiments

Module Name	Electrical Engineering Experiments		
The semester in which this module is taught	Semester 4		
Module Leader	Chen Shuliang, Cao Zhe		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized method: unit teaching, independent design Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 1 hour per week (2 hours in the last week), a total of 9 weeks, 10 hours, including: after-class experiments, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	Engineering electromagnetic field and circuit theory		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the working principle of transformers and various motors, the magnetic field distribution during normal and stable operation, the analysis methods and theories used, and the performance during steady-state operation; Correctly establish voltage equations and torque equations, and clarify the conversion power, electromagnetic	R4

		power and their relationship with electromagnetic rotation distance in the motor; There should be a clear physical concept of the parameters of the motor during steady-state operation; Proficient in using equivalent circuits and complex numbers to calculate the performance of transformers and AC motors.	
	CLO2	Through the training of the recognition experimental class, the knowledge learned is gradually integrated, and the ability to analyze and solve practical problems is initially possessed; Through experiments, master the basic experimental methods and operating skills of motors, such as starting and speed regulation of motors, voltage building and frequency regulation of generators, voltage regulation, adjustment of rated points of generators and motors and determination of rated excitation current, and methods for obtaining and measuring operating performance, losses, and steady-state parameters. be able to analyze and evaluate the experimental results, and have the ability to check motor faults preliminarily; Master the basic motor electric dragging method and its working principle, such as forward and reverse rotation of three-phase induction motor, star triangle start, DC motor starting, forward and reverse rotation, speed regulation and braking, etc.; Continuous learning ability: have lifelong learning awareness, independent learning ability and self-development potential, and be able to achieve in-depth expansion and horizontal transfer of knowledge and ability through continuous learning, and adapt to the sustainable development of society and individuals.	R5
	CLO3	Discipline; have good integrity, professionalism, sense of responsibility, social morality and professional ethics; It has a high level of cultural accomplishment, strong aesthetic ability and	R8

		noble moral sentiments, and has a rigorous and scientific way of thinking and truth-seeking spirit.	
content	The electrical engineering experimental course enables students to comprehensively grasp the basic structure and operating principle of transformers, synchronous machines, asynchronous machines, and DC machines through experiments. Proficient in the basic theory of electromagnetism and its analysis methods of the "four major motors", and be able to effectively use tools such as equation systems, equivalent circuits and phasor diagrams to analyze and solve practical problems related to electrical engineering. Master some motor control basics. Teaching content: Project 1: No-load and short-circuit experiment of three-phase transformer (weight 2/18, level: understanding + application). Project 2 Parallel operation experiment of single-phase transformer (weight 2/18, level: understanding + application). Project 3 No-load and load experiment of three-phase cage asynchronous motor (weight 4/18, level: understanding + application). Project 4 Synchronous motor characteristic test experiment (weight 4/18, level: understanding + application). Project 5 Comprehensive Experiment - Micro AC Grid-connected Power Generation System (Weight 6/18, Level: Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses the students' experimental reports and independent learning composition scores. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of curriculum knowledge objectives, ability objectives and literacy goals is evaluated.		
Study and exam	The evaluation is based on a 100-point system, and 60 points are the		

requirements	passing score for this course
Read the list	1. Self-compiled experimental instructions and experimental reports. 2. Zhang Ting's main change. Electrical Engineering Experimental Tutorial. Machinery Industry Press, 2018.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Steady-state analysis of power system

Module Name	Steady-state analysis of power system		
The semester in which this module is taught	Semester 4		
Module Leader	Wang Lu and Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: curriculum design		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 56 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 2 hours per week, a total of 10 weeks, 20 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	"Circuit Theory 1", "Circuit Theory 2", "Electrical Engineering"		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the composition, brief history, current situation and progress trend of the power system, the relationship between the stable active power of the power system and the frequency of the system, and the relationship between the reactive power of the power system and the voltage level of the system. Master the mathematical models and parameter calculation methods of power components and power systems, the power flow calculation methods of various simple powers, the mathematical models and common calculation methods of power flow operation of power systems, the optimal distribution principle of active power in the power	R1、R2

		system, the frequency adjustment method and its calculation, the principle of optimal distribution of reactive power supply and the optimal compensation of reactive load and its calculation, and the voltage adjustment method, calculation and application of the power system. Be able to apply the knowledge of this course to the planning, design and calculation of power engineering, and apply relevant procedures to calculate the power flow distribution of the power system.	
	CLO2	Understand the basic analysis methods of power system analysis, and preliminarily master the analysis methods to solve problems. Develop the habit of independent thinking, diligent thinking, and good at asking questions, and be able to comprehensively understand and analyze what you have learned.	R8
	CLO3	Through the study of power system analysis courses, students can understand the power system, stimulate students' interest in learning, promote them to deepen their understanding of their majors, and cultivate a sense of professional belonging.	R10、R11
content	Based on circuit theory and electrical engineering, "Power System Steady State Analysis" mainly focuses on the modeling methods of power systems, power flow calculation methods and analysis and calculation methods for optimal operation of power systems under the steady state of power systems. Through the study of this course, students can establish the basic concepts of the power system; master the main content and analysis and calculation methods of the steady state of the power system; At the same time, cultivate students' dialectical thinking ability and establish a scientific perspective that links theory with practice; It lays the foundation for learning, analyzing and solving engineering problems in the operation of the power system in subsequent professional courses. Teaching content: Chapter 1 Basic Concepts of Power System (Weight 4/36, Level: Understanding + Evaluation) Chapter 2 Mathematical Models of Power Systems (Weight 8/36, Level: Understanding + Application) Chapter 3 Calculation and Analysis of Simple Power Networks (Weight 6/36, Level: Understanding + Application + Analysis)		

	Chapter 4 Computer Algorithms for Power Flow in Complex Power Systems (Weight 6/36, Level: Understanding + Application + Analysis) Chapter 5 Active Power and Frequency Adjustment of Power System (Weight 6/36, Level: Understanding + Application + Analysis) Chapter 6 Reactive Power and Voltage Adjustment of Power System (Weight 6/36, Level: Understanding + Application + Analysis)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, midterm exams and classroom discussions. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1Chen Heng, editor-in-chief. Steady-state analysis of power system. China Electric Power Press, 2015. 2. Sun Qiuye, editor-in-chief. Power System Analysis. Machinery Industry Press, 2022. 3. Mu Gang, editor-in-chief. Power System Analysis. Machinery Industry Press, 2022.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Transient analysis of power system

Module Name	Transient analysis of power system		
The semester in which this module is taught	Semester 5		
Module Leader	Wang Lu and Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 56 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 2 hours per week, a total of 10 weeks, 20 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	"Circuit Theory 1", "Circuit Theory 2", "Electrical Engineering", "Steady-State Analysis of Power Systems"		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master and explain the concept of transient state in the power system, master the practical calculation method of three-phase short-circuit current in the power system, be able to analyze and calculate the symmetrical and asymmetric fault states of the power system, understand the basic concepts of transient stability and static stability of the power system, master the principle and method of analyzing the characteristics of transient stability in the equal area, and understand the control measures of transient stability. Master the method of analyzing the static stability of the power system by the small disturbance method, and understand the influence of the automatic excitation regulator on the static stability. Master the discrimination	R1、R2

		method of static stability of complex power systems, and use static stability reserve coefficient and other indicators to evaluate the static stability level.	
	CLO2	Understand the basic analysis methods of power system transient analysis, and master the analysis methods to solve the transient problems of the power system. Develop the habit of independent thinking, diligent thinking, and good at asking questions, and be able to comprehensively understand and analyze what you have learned.	R8
	CLO3	Let students further understand the power system, stimulate students' interest in learning, promote them to deepen their understanding of their majors, and cultivate a sense of belonging to the major; Establish students' scientific spirit and strengthen the scientific attitude of truth-seeking, truth-seeking and innovation.	R10、R11
content	The course of transient analysis of power systems is one of the main compulsory courses of electrical engineering and its automation. Through the study of this course, students can master the basic concepts of the power system, master the principles and methods of electromagnetic transient process after a fault in the power system (fault analysis) and the electromechanical transient process after the power system is disturbed by various disturbances (steady-state analysis). Through the mathematical modeling of the power system during transient operation and the calculation of grid operation parameters, students' ability to analyze and solve technical and economic problems during transient operation of the power grid is		

	improved. Teaching content: Chapter 1 Basic knowledge of power system fault analysis (weight 4/36, level: understanding + application) Chapter 2 Analysis of Sudden Three-phase Short Circuit of Synchronous Generator (Weight 6/36, Level: Understanding + Application) Chapter 3 Analysis and Calculation of Symmetric Faults in Power Systems (Weight 6/36, Level: Understanding + Application + Analysis) Chapter 4 Analysis and Calculation of Asymmetric Faults in Power Systems (Weight 6/36, Level: Understanding + Application + Analysis) Chapter 5 Overview of Power System Stability (Weight 4/36, Level: Understanding + Application + Analysis) Chapter 6 Static Stability of Power System (Weight 4/36, Level: Understanding + Application + Evaluation) Chapter 7 Transient Stability of Power System (Weight 6/36, Level: Understanding + Application + Evaluation)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects, midterm exams and classroom discussions. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1.Fang Wanliang, Li Jianhua, Wang Jianxue, editors-in-chief. Transient analysis of power system. China Electric Power Press, 2017。 2. Sun Qiuye, editor-in-chief. Power System Analysis. Machinery Industry Press, 2022. 3. Mu Gang, editor-in-chief. Power system analysis. Machinery Industry Press, 2022.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Power plant/substation electrical part

Module Name	Power plant/substation electrical part		
The semester in which this module is taught	Semester 5		
Module Leader	Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: teaching method (PPT, video demonstration), case teaching, questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical methods: project practice, practice method.		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 56 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 2 hours per week, a total of 10 weeks, 20 hours, including: after-class homework, exam preparation time, etc.		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Circuit Theory, Power Electronics Technology, Electrical Engineering		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the basic form of main wiring of power plants and substations, the wiring characteristics of power plants, the design methods of main wiring , the wiring methods of plant electricity, the selection of power distribution devices, the main electrical equipment and its selection methods; Preliminary mastery of the design and calculation method of the main electrical system of power plants and substations;	R2、R3
	CLO2	master the key skills of the electrical part of the power plant substation; Cultivate students to have the ability to apply and maintain the electrical	R5、R6

		part of power plants and substations. cultivate students' basic abilities related to electrical design, maintenance, installation, operation and maintenance;	
	CLO3	cultivate a serious and responsible learning attitude and a rigorous and meticulous work style; Cultivate scientific thinking and truth-seeking spirit	R11
content	This course mainly introduces the relevant knowledge of the electrical primary system of power plants and substations, so that students can master the basic form of the main wiring of power plants and substations, learn the characteristics of the main wiring of various power plants, the design method of the main wiring of various power plants, the wiring method of the plant, the selection of power distribution devices, the main electrical equipment and its selection methods, etc., so that students can initially master the design and calculation methods of the electrical main system of the power plant and substation, so that they can engage in electrical design and other relevant electrical design in the future. Overhaul, installation, operation, maintenance and management lay the necessary foundation. Teaching content: Chapter 1 Introduction (weight 2/36, level: memory). Chapter 2 High Voltage Switching Appliances (Weight 4/36, Level: Memory + Comprehension) Chapter 3 Transformer (weight 4/36, level: memory + understanding) Chapter 4 Electrical Main Wiring (Weight 6/36, Level: Understanding + Application) Chapter 5 Self-consumption of power plant substations (weight 4/36, level: understanding + application) Chapter 6 Power Distribution Device (Weight 4/36, Level: Memory) Chapter 7 Neutral Grounding Method of Power System (Weight 4/36, Level: Memory + Understanding) Chapter 8 Heating, Electric Power and Selection of Current-Carrying Conductors (Weight 4/36, Level: Understanding + Application) Chapter 9 Selection of Electrical Equipment (Weight 4/36, Level: Understanding + Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process		

	assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, midterm exams and participation in discussion activities. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book form, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Liu Baogui, editor-in-chief. Electrical part of the substation of the power plant (third edition).China Electric Power Press, 2021. 2. Xiong Xinyin, editor-in-chief. Power plant electrical part. China Electric Power Press, 2014. 3. Yao Chunqiu, editor-in-chief. Power plant electrical part. China Electric Power Press, 2007.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

The principle of power system relay protection

Module Name	The principle of power system relay protection		
The semester in which this module is taught	6th semester		
Module Leader	Li Ping, Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: case teaching, questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 2 hours per week, a total of 15 weeks, 30 hours, including: after-class homework, pre-class preview		
Credits	3 credits		
Prerequisites required and recommended for joining this module	circuit theory, power system analysis		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	To enable students to master the basic principles of current protection and distance protection of transmission lines, as well as the calculation and operation analysis methods of current protection and distance protection; master the principle of automatic reclose; Master the configuration of transformer protection and the principle of differential protection and the principle of tuning calculation; Master the configuration, principle and tuning calculation principle of generator and bus protection.	R1、R2、R3、R4
	CLO2	Students have the ability to use the basic knowledge and scientific methods of power	R9

		system relay protection to analyze complex engineering problems and propose solutions, and have the ability to design, optimize and put forward innovative ideas in the process of relay protection of various components of the power system.	
	CLO3	Enable students to learn to communicate with others, learn to cooperate, and correctly handle the relationship between individuals and teams.	R11
content	"Principles of Power System Relay Protection" is the core course of electrical engineering and its automation, and is a professional course that must be mastered to engage in power system automation. This course mainly introduces the principles, implementation technologies and ideas and methods of power system relay protection, so that students can master the design, tuning calculation and analysis methods of power system relay protection, and lay a theoretical foundation for the design, manufacturing, operation and maintenance and scientific research of power systems and related fields. Teaching content: Chapter 1 Grid Current Protection (Weight 12/54, Level: Understanding, Application, Analysis). Chapter 2 Grid Distance Protection (Weight 12/54, Level: Understanding, Application, Analysis). Chapter 3 Automatic Reclosure (Weight 4/54, Level: Understanding). Chapter 4 Power Transformer Protection (Weight 10/54, Level: Understanding, Application, Analysis). Chapter 5 Generator Protection (Weight 10/54, Level: Understanding, Application, Analysis). Chapter 6 Bus protection (weight 6/54, level: understanding).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	1. "Power System Relay Protection", edited by Zhang Baohui and Yin Xianggen, China Electric Power Press, published in January 2024.		

	2. "Principles of Relay Protection", edited by Liu Xuejun, China Electric Power Press, published in March 2007. 3. "Relay Protection Training Textbook (Up and Down)", China Electric Power Press, April 2009.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Experiment on the principle of relay protection of power system

Module Name	Experiment on the principle of relay protection of power system		
The semester in which this module is taught	6th semester		
Module Leader	Li Ping, Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Teacher-centered methods: questioning, discussion; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized method: unit teaching, independent design Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 28 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 2 hours per week, 5 weeks in total, 10 hours, including: pre-class preview, experiment report		
Credits	1 credit		
Prerequisites required and recommended for joining this module	The principle of power system relay protection		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through this course, students can further master the principle of relay protection energy and tuning calculation methods of transmission lines, power transformers, generators, and busbars.	R4
	CLO2	Through this course, students can choose research routes and design feasible experimental schemes based on research objectives and object characteristics. Enable students to combine theory and practice, correctly select experimental equipment, carry out experiments safely, and	R8、R9

		analyze experimental data effectively and correctly.	
	CLO3	Through this course, students will have the quality of professional ethics and norms that abide by honesty, fairness and code.	R10
content	"Experiment on the Principle of Power System Relay Protection" is a professional core course of electrical engineering and automation undergraduate major. Through this course, students can master the principles of common protection, understand the composition principles, implementation methods and general debugging methods of important relays; Master the basic principles of relay protection setting calculation, and have a certain ability to experiment and debug relay protection devices, so as to achieve the purpose of assisting teaching, enhancing perceptual understanding, and improving students' analysis and problem-solving ability. Teaching content: Project 1 Conventional relay characteristics experiment (weight 4/18, level: understanding, application, analysis). Project 2 Transmission line current and voltage conventional protection experiment (weight 2/18, application, analysis). Project 3 Transmission line distance protection experiment (weight 4/18, level: application, analysis). Project 4 Transformer differential protection experiment (weight 4/18, level: application, analysis). Project 5 Comprehensive Design Experiment - Microcomputer Protection Experiment of Transmission Line (Weight 4/18, Level: Analysis, Evaluation, Creation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, classroom performance, and phased tests. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through skill tests, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	"Experimental Guide for Power System Relay Protection", edited by the Electrical Teaching and Research Office of Yunnan College of Economics and Management, published in March 2022.		

Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Engineering training

Module Name	Engineering training		
The semester in which this module is taught	Semester 3		
Module Leader	Chen Guiyong		
language	Chinese		
Relationship to the curriculum	Professional concentrated practice course		
Teaching methods	Teacher-centered approach: blended, lecture-based, heuristic/guided teaching, open-ended/inquiry-based, project-based learning; Interactive methods: inquiry-based problem learning, teaching seminars (including group discussions), and task-driven teaching methods; Individualized approach: unit teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 60 hours Teaching hours: 4 hours per week, 5 weeks in total, 20 hours Self-study hours: 8 hours per week, 5 weeks in total, 40 hours, including: pre-class preview, post-class writing of experimental report homework.		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Engineering Drawing, Circuit Theory (1), Circuit Theory (2)		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the general process of mechanical manufacturing, mechanical manufacturing process knowledge and the application of some new processes and new technologies in mechanical manufacturing;	R1
	CLO2	Able to collect and organize experimental data, analyze and interpret experimental data, draw reasonable and effective conclusions, and put forward their own unique insights and innovative processing methods in manufacturing processes and methods.	R3

	CLO3	Through the practical learning of this course, students will be familiar with the common processing methods of mechanical parts and the working principles and typical structures of the main equipment used, the use of clamps and measuring tools and safe operation techniques, abide by the safe operation procedures, and establish the necessary innovation ability, industrial safety awareness and teamwork awareness.	R5、R6
content	Through the experimental teaching of this course, it is required to understand the general process of mechanical manufacturing, the knowledge of mechanical manufacturing process and the application of some new processes and new technologies in mechanical manufacturing; Familiar with the common processing methods of mechanical parts and the working principles and typical structures of the main equipment used, the use of clamp measuring tools and safe operation techniques; Familiar with the basic operation skills of turning, pliers, milling, welding and CNC machining, have certain operating experience in turning, pliers, milling, welding, machining centers and special processing, be familiar with and abide by safety operating procedures, and establish the necessary innovation ability and industrial safety awareness. Teaching content: Project 1 Basic Training in Machining (Weight: 8/20, Level: Memory, Understanding, Application, Analysis) Project 2 Welding Training (Weight 4/20, Level: Memory, Understanding, Application, Analysis) Project 3 CNC machining training (weight 4/20, level: memory, understanding, application, analysis) Project 4 Special Technology Application Training (Weight 2/20, Level: Memory, Understanding, Application, Analysis) Item 5 Advanced Technology Processing Training (Weight 2/20, Level: Memory, Understanding, Application, Analysis)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60%		

	of the total evaluation score. The achievement of curriculum knowledge objectives, ability goals and literacy goals is mainly evaluated through the evaluation of experimental reports.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Self-edited by the Engineering Training Course Group of Yunnan College of Economics and Management. Engineering Training Experimental Instructions.2022. [2] Cai Anjiang, ed., Engineering Training, Electronic Industry Press Press, March 2020 [3] Liu Xiaogang, ed., "Metallurgy Internship Textbook", Metallurgical Industry Press, January 2014 [4] Yu Chunsheng, ed., "CNC Machine Tool Programming and Application", Higher Education Press, December 2014.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Electronic craft production

Module Name	Electronic craft production		
The semester in which this module is taught	Semester 3		
Module Leader	Yang Yu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized approach: unit teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 60 hours Teaching hours: 20 hours per week, 1 week, 20 hours Self-study hours: 10 hours per week, 4 weeks in total, 40 hours		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Circuit basics, analog electronics technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Students need to master the correct use of common welding tools and electrical instruments. Master the principles and use of commonly used electronic devices. Familiarize yourself with how commonly used multimeters work.	R3
	CLO2	Students need to master the knowledge and skills necessary for safe electricity use for on-the-job operation. Cultivate students' love for science and seek truth from facts. Cultivate students' serious and meticulous work attitude. Cultivate students' innovative spirit. Enhance students' awareness of quality and professional ethics.	R6、R7
	CLO3	Students cooperate with each other to complete	R9

		the installation and debugging of circuit components. Master the inspection and repair skills of circuit boards in small and medium-sized electrical appliances. The ability to work with the team to complete the analysis and troubleshoot all kinds of faults.	
content	"Electronic Process Production" mainly cultivates students' practical operation skills and the ability to solve engineering problems, and cultivates technical and skilled talents for the position group of circuit board soldering. Through the study of this course, students are required to master the knowledge of electrical drawing, drawing, component installation, debugging and operation skills, fault analysis, repair and circuit maintenance skills, the use of common welding tools and instruments and safety civilization. Teaching content: Discrimination and measurement of project components, schematic recognition (weight 4/20, level: memory + understanding + application). Project 2 Installation and Welding (Weight 8/20, Level: Understanding - Application). Project 3: Debugging, troubleshooting and verification (weight 8/20, level: application + analysis + evaluation).		
Assessment form	1. The course assessment consists of a final assessment. 2. Grade evaluation: Overall course evaluation score = final assessment × 100% (1) Final assessment, full score of 100 points, accounting for 100% of the overall evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	Self-edited handouts.		
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS		

Job cognition internship

Module Name	Job cognition internship		
The semester in which this module is taught	Semester 4		
Module Leader	Qiao Lin, Cao Zhe		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive Approach: Teaching and Learning (including group discussions); Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 60 hours Teaching hours: 20 hours per week, 1 week, 20 hours Self-study hours: 10 hours per week, a total of 4 weeks, 40 hours, including: pre-class preview, job cognition practice report		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Power plant/substation electrical part, electrical measurement technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Let students understand the technical standards and production lifestyle within the power plant and the related enterprise management system.	R1
	CLO2	Cultivate students' divergent thinking, strengthen students' professional sensitivity, and flexibility in the application of professional knowledge.	R6、R7
	CLO3	Enhance students' awareness of quality and professional ethics, and optimize students' team consciousness and humanistic style. cultivate students' love for science and seek truth from facts; Serious and meticulous work attitude.	R9、R11
content	The main purpose of the internship is to lay a good foundation for the study of subsequent professional courses. Through internship, cultivate		

	students' learning methods and observation and analysis skills of objective things by linking theory with practice. Focus on learning the power production process and main equipment of the power plant power generation system. After the internship, students should have a clear perceptual understanding of the production process of the power plant, have a preliminary understanding of the development prospects of the industry, and provide conditions for future career choice and employment, and point out the direction. Teaching content: Project 1 Power plant safety education publicity (weight 1/20, level: understanding). Project 2 Visit the whole factory at one time (weight 1/20, analysis and evaluation). Project 3 Visit the main plant, switching station, power distribution room, RTU room (weight 2/20, analysis, evaluation). Item 4 Use of Measuring Instruments (Weight 6/20, Application, Analysis). Item 5 Instrumentation verification (weight 4/20, application, analysis). Item 6 Withstand voltage test and discharge test (weight 5/20, application, analysis, evaluation). Item 7 Parameter measurement (weight 1/20, application, analysis, creation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses the completion of students' independent learning and internship tasks. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	"Introduction to Modern Power Plants" by Wen Feng, published in July 2008.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Electrician training

Module Name	Electrician training		
The semester in which this module is taught	Semester 5		
Module Leader	Li Xingyuan, Yang Yu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Method of practice: project practice Individualized approach: unit teaching		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 60 hours Teaching hours: 20 hours per week, 1 week, 20 hours Self-study hours: 10 hours per week, a total of 4 weeks, 40 hours, including: after-class homework, exam preparation time, etc		
Credits	2 credits		
Prerequisites required and recommended for joining this module	Electrical Engineering, Electrical Control and PLC Technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Students need to master the correct use of common electrical tools and electrical instruments. Master the principles and use of commonly used motors and electrical appliances. Familiarize yourself with the working principles of common machine tool control lines.	R1
	CLO2	Students need to master the knowledge and skills necessary for safe electricity use for on-the-job operation. Cultivate students' love for science and seek truth from facts. Cultivate students' serious and meticulous work attitude. Cultivate students' innovative spirit. Enhance students' awareness of quality and professional ethics.	R5
	CLO3	Students cooperate with each other to complete	R8、R9

		the installation and commissioning of the motor control line. Master the more complex operation skills in the control line of machine tools. The ability to work with the team to complete the analysis and troubleshoot all kinds of faults.	
content	Through the study of this course, students are required to master the knowledge of electrical drawing, drawing, drawing, electrical installation, commissioning and operation skills, fault analysis, repair and equipment maintenance and overhaul skills, the use of common electrical tools and instruments, and safe civilized production. Teaching content: Project 1 Forward and reverse control circuit of three-phase asynchronous motor (weight 8/24, level: memory + understanding + application). Project 2 Star Triangle Start Control Circuit of Three-Phase Asynchronous Motor (Weight 8/24, Level: Memory + Understanding + Application). Project 3 Forward start and reverse stop control circuit of three-phase asynchronous motor (weight 8/24, level: memory + understanding + application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of curriculum knowledge objectives, ability objectives and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] Bao Jieqiu. Electrician Practical Training Course (Second Edition).China Electric Power Press, 2022.01.		
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS		

Power system relay protection course design

Module Name	Power system relay protection course design		
The semester in which this module is taught	6th semester		
Module Leader	Li ping		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interactive Approach: Teaching and Learning (including group discussions); Individualized approach: independent design Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 30 hours Teaching hours: 2 hours per week, 5 weeks, 10 hours Self-study hours: 4 hours per week, 5 weeks in total, 20 hours, including: pre-class preview, course design report		
Credits	1 credit		
Prerequisites required and recommended for joining this module	The principle of power system relay protection		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through the study of this course, students can master the general steps of relay protection design, master the engineering design manual and design specifications, the selection of power system protection methods, protection configuration, tuning calculation, and protection evaluation methods.	R1、R2
	CLO2	Through this course, students have the ability to present design results in the form of drawings, reports, calculations or physical objects.	R3、R4
	CLO3	Through this course, students will cultivate their awareness of independent learning and lifelong	R9、R11

		learning.	
content	"Principles of Power System Relay Protection" is a professional core course for undergraduate majors in electrical engineering and automation, and "Power System Relay Protection Course Design" is its supporting course. Through the study of this course, students will have a certain ability to design, experiment and debug relay protection devices, so as to achieve the purpose of auxiliary teaching, enhance perceptual understanding, and improve students' analysis and problem-solving ability. Teaching content: Topic 1 Design of relay protection scheme for a 35kV step-up substation (weight 10/10, level: understanding, application, analysis, evaluation, creation). Topic 2 Design of a 110KV power grid relay protection scheme (weight 10/10, application, analysis, evaluation, creation).	
Assessment form	1. The course assessment consists of process assessment and design defense assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 60% + design defense × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. It mainly assesses students' design preparation, design process, and design results. (2) Design defense, full score of 100 points, accounting for 40% of the total evaluation score. The achievement of the knowledge objectives, ability goals and literacy goals of the course is mainly evaluated through on-site defense assessment.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	"Power System Relay Protection Course Design Guide", edited by the Electrical Teaching and Research Office of Yunnan College of Economics and Management, published in March 2022.		
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS		

Power System Analysis Course Design

Module Name	Power System Analysis Course Design		
The semester in which this module is taught	6th semester		
Module Leader	Wang Lu		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized approach: independent design Practical method: design method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 30 hours Teaching hours: 2 hours per week, 5 weeks, 10 hours Self-study hours: 4 hours per week, 5 weeks in total, 20 hours, including: after-school homework, exam preparation time, etc		
Credits	1 credit		
Prerequisites required and recommended for joining this module	"Power System Steady State Analysis", "Power System Transient Analysis"		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the establishment of basic mathematical models for power flow calculation, Newton-Rafson power flow calculation method, power system power flow manual calculation method and power system power flow computer calculation method; Be able to apply the knowledge of this course to plan design and calculate power engineering, and apply existing programs to calculate power flow distribution in power systems.	R1、R2
	CLO2	Through the course design, students can strengthen their understanding of the power system analysis course, learn to search for	R8

		information, compare schemes, design calculations, analyze and summarize, and further improve their ability to analyze and solve practical problems.	
	CLO3	Further understand the knowledge learned, consolidate and deepen it, broaden the knowledge horizon, and improve students' comprehensive ability.	R10、R11
content	The design of the power system analysis course is a comprehensive practical link for electrical engineering and automation majors, with the aim of enabling students to master the comprehensive application skills of electrical engineering and automation related courses. Through the design of this course, students can get an independent engineering practice exercise in course design, help students cultivate solid practical skills, establish a rigorous scientific attitude, and form a good engineering awareness. And in the actual design process, learn to find, analyze and solve problems, and apply the theoretical knowledge learned to practice. Teaching content: Regional Power Network Design (Weight 10/10, Level: Understanding + Application + Analysis + Creation)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = process assessment × 60% + course design report evaluation × 40% (1) Procedural assessment, scored on a percentage system, accounting for 60% of the overall evaluation score. It mainly assesses students' independent learning, phased assessment, classroom discussion, and group reporting. (2) Course design report evaluation, full score of 100 points, accounting		

	for 40% of the total evaluation score. The teaching content is mainly assessed in the form of curriculum design reports, and the achievement of curriculum knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1.Guo Liping, Gu Xiufang. Power System Analysis Course Design Guidance and Example Analysis. Water Conservancy and Hydropower Press, 2011. 2. Chen Heng, editor-in-chief. Steady-state analysis of power system. China Electric Power Press, 2015. 3. Fang Wanliang, Li Jianhua, Wang Jianxue, editor-in-chief. Transient analysis of power system. China Electric Power Press, 2017.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Graduation internship

Module Name	Graduation internship		
The semester in which this module is taught	7th and 8th semesters		
Module Leader	Joleen		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 480 hours Teaching hours: 10 hours per week, 16 weeks in total, 160 hours Self-study hours: 20 hours per week, 16 weeks in total, 320 hours, including: after-school homework, exam preparation time, etc		
Credits	16 credits		
Prerequisites required and recommended for joining this module	"Electrical Part of Power Plant/Substation", "Electrical Measurement Technology", "Electrical Control and PLC Technology"		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Theory is linked to practice, and book knowledge is integrated to form an individual's knowledge system in a certain field or aspect, and to understand the application of these knowledge systems in engineering. Strengthen the cultivation and training of problem discovery and problem-solving ability in engineering practice, as well as innovation ability.	R6、R7
	CLO2	Achieve professional training goals, be familiar with engineering facilities and related equipment in related technical fields, and understand the design ideas and processes of engineering projects. Prepare for the graduation project through internship, obtain necessary training in data collection, plan determination, data inquiry and other links, and also select graduation project topics according to the specific situation of the	R8、R9

		internship unit.	
	CLO3	Receive training in adapting to the field, social activities and interpersonal skills, and improve their comprehensive quality.	R10、R11
content	Graduation internship is one of the important practical teaching links in the College learning stage, through the internship, students will further understand the society, enhance their sense of responsibility and mission for socialist modernization, consolidate and apply the courses they have learned, and connect theory with practice; broaden your knowledge, further understand the professional technology and application status, and deepen your understanding of the needs of this major. Teaching content: Chapter 1 Control Electrical Control Technology, Equipment and Operating Process and Management Procedures (Weight 32/160, Level: Understanding + Application) Chapter 2 Communication Technology, Equipment and Operating Process and Management Procedures (Weight 32/160, Level: Understanding + Application) Chapter 3 Technology, equipment, operation process and management procedures related to computer communication networks (Weight 32/160, level: understanding + application + analysis) Chapter 4 Motion Control Technology, Equipment and Operating Process and Management Procedures (Weight 32/160, Level: Understanding + Application + Analysis) Chapter 5 Technology, Equipment and Operation Process and Management Procedures Related to Electrical Engineering (Weight 32/160, Level: Understanding + Application + Analysis)		
Assessment form	1. Grade evaluation: Overall course evaluation score = internship performance ×40% + internship report score ×60% 2. The internship score adopts a five-level system: 90-100 points excellent, 80-89 points good, 70-79 points medium, 60-69 points passing, and 60 points or less failing.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	[1] Wang Renxiang. Introduction to New Electric Power Technologies: China Electric Power Press, 2009. [2] Ge Dongfang. Electrical Design Manual of Power Engineering. Volume 1, Electrical Primary Part: China Electric Power Press, 1989. [3] Ding Yushan, Lei Zhenshan. Design manual for small and medium-sized substations. China Water Conservancy and Hydropower Press, 2000.		
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS		

Graduation Thesis (Design)

Module Name	Graduation Thesis (Design)		
The semester in which this module is taught	Semester 8		
Module Leader	Joleen		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning; Individualized approach: independent design Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 420 hours Teaching hours: 10 hours per week, 14 weeks in total, 140 hours Self-study hours: 20 hours per week, a total of 14 weeks, 280 hours, including: after-class homework, exam preparation time, etc		
Credits	14 credits		
Prerequisites required and recommended for joining this module	Power plant/substation electrical part, electrical measurement technology, electrical control and PLC technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through the graduation project (thesis), students can apply engineering foundation and professional knowledge to the analysis and optimization of electrical engineering problems, and complete the graduation project through the comparison and synthesis of models.	R1、R2、R3
	CLO2	Through the graduation project (thesis), students can understand the impact of electrical engineering on public safety, health and environmental protection, and consciously fulfill their responsibilities in engineering practice.	R7、R8
	CLO3	Through the graduation project (thesis), students are able to recognize the need for continuous	R11、R12

		exploration and learning, and have the awareness of independent learning and lifelong learning.	
content	Through the completion of all stages of graduation design, students can improve their ideological and moral character, cultivate excellent work attitude and work style, and focus on training students' ability to comprehensively apply the basic theories, basic knowledge and basic skills they have learned, as well as the ability to analyze and solve practical problems. In the basic training of industrial engineers, students can further deepen their theoretical knowledge, improve their practical engineering skills and independent work ability. Teaching content: Graduation thesis (design) (weight 140/140, level: memory + understanding + application + analysis + evaluation + creation).		
Assessment form	1. Grade evaluation: Overall course evaluation score = instructor score ×40% + evaluation teacher score ×20% + defense score ×40% 2. The graduation thesis (design) score adopts a five-level system: 90-100 points excellent, 80-89 points good, 70-79 points medium, 60-69 points pass, 60-69 points pass, 60 points or less failed.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		
Read the list	not		
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS		

Electrical measurement technology

Module Name	Electrical measurement technology		
The semester in which this module is taught	Semester 3		
Module Leader	Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: teaching method (PPT, video demonstration), case teaching, questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical methods: project practice, practice method.		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours. It includes 24 hours of theory and 12 hours of experiment. Self-study hours: 3 hours per week, a total of 18 weeks, 48 hours, including: after-school homework, exam preparation time, etc.		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Circuit Theory, Fundamentals of Analog Electronics Technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through this course, students can be proficient in the basic concepts, methods and related units of measurement in theory; Let students master the distribution and synthesis of measurement errors, the correct selection of instruments and the method of composing a reasonable measurement system; master the measurement, analysis and application of electrical parameters and circuit parameters; Let students know and understand the sources, propagation and common methods of suppressing interference.	R5

	CLO2	Make students proficient in the use of basic electrical measurement tools and related instruments; Make students proficient in the identification, measurement and use of circuit components; Make students proficient in the power supply, distribution and measurement of three-phase electricity; Let students master the wiring, inspection and operation of simple electrical control lines.	R5
	CLO3	cultivate a serious and responsible learning attitude and a rigorous and meticulous work style; Cultivate students' ability to find and solve problems.	R8
content	Electrical measurement technology is a highly practical course, through which students can systematically master modern measurement principles, measurement methods, data collection, error analysis and other related knowledge, master the structural principles, selection and use methods of commonly used measuring instruments, and lay a solid foundation for the use and verification of electrical instruments in the future. Teaching content: Chapter 1 Basic knowledge of measurement and measurement systems (weight 4/36, level: memory). Chapter 2 Measurement Error and Its Analysis (Weight 4/36, Level: Memory + Comprehension). Chapter 3 Basic characteristics of measurement systems (weight 6/36, level: memory + understanding). Chapter 4 Measurement of Electrical Parameters (Weight 10/36, Level: Understanding + Application) Chapter 5 Measurement of Circuit Parameters (Weight 8/36, Level: Understanding + Application) Chapter 6 Measurement of Magnetic Parameters (Weight 2/36, Level: Memory) Chapter 7 Interference and Inhibition (Weight 2/36, Level: Memory + Comprehension)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting		

	for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test open book, and the achievement of the course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1 He Daoqing, editor-in-chief. Electrical measurement technology. Chemical Industry Press, 2022. 2. He Daoqing, editor-in-chief. Electrical measurement technology. Chemical Industry Press, 2015. 3. Tao Shishu, editor-in-chief. Electrical measurement. Harbin Institute of Technology Press, 2019.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Python programming

Module Name	Python programming		
The semester in which this module is taught	Semester 4		
Module Leader	Zhao Xiong		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized Approach: Computer-Assisted Teaching Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 3 hours per week, 14 weeks in total, 42 hours Self-study hours: 3 hours per week, a total of 14 weeks, 42 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	/		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	By studying this course, students can understand the basic principles and development history of computers, master basic Python programming skills, understand the underlying logic and general methods of programming, and have the ability to use programming languages to solve general problems.	R1
	CLO2	Programming ability, the ability to select and use appropriate information technology tools, programming languages, engineering tools and simulation software to analyze, calculate and design complex engineering problems in the field of electrical engineering.	R2

	CLO3	Develop logically clear and creative computer thinking.	R3
content	Interdisciplinary integration is the only way to cultivate compound talents to meet the needs of national social development, and Python Programming is a representative course to promote interdisciplinary development. Through the teaching of computer basics, Python basics and common python practical cases, this course allows electrical students to establish basic computer thinking, and reserve a powerful tool for subsequent professional learning, subject competitions, thesis writing, internship and employment. This syllabus only includes theoretical hours of teaching, and experimental teaching is stipulated in accordance with the outline of "Python Programming Experiment". Teaching content: Chapter 1 First Understanding of Python and Computer Basics (Weight 6/42, Level: Memory + Understanding + Application). Chapter 2 Python Program Instance Analysis (Weight 4/42, Level: Memory + Understanding + Application). Chapter 3 Basic Data Types (Weight 4/42, Level: Memory + Comprehension + Application). Chapter 4 Control Structure of Programs (Weight 6/42, Level: Memory + Understanding + Application). Chapter 5 Function and Code Reuse (Weight 6/42, Level: Memory + Understanding + Application). Chapter 6 Combining Data Types (Weight 6/42, Level: Memory + Understanding + Application). Chapter 7 File and Data Formatting (Weight 2/42, Level: Memory + Understanding + Application). Chapter 8 Programming Methods (Weight 4/42, Level: Memory + Understanding + Application). Chapter 9 Scientific Computation and Visualization (Weight 2/42, Level: Memory + Understanding + Application). Chapter 10 Web Crawler and Automation (Weight 2/42, Level: Memory + Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, online learning results, classroom performance and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through computer-based examinations, and the achievement of course		

	knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Song Tian, Li Xin, Huang Tianyu. Fundamentals of Python Language Programming, 2nd Edition. Higher Education Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Python programming experiments

Module Name	Python programming experiments		
The semester in which this module is taught	Semester 5		
Module Leader	Zhao Xiong		
language	Chinese		
Relationship to the curriculum	Professional compulsory courses		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized Approach: Computer-Assisted Teaching Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 42 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 3 hours per week, a total of 8 weeks, 24 hours, including: after-class experiments, exam preparation time, etc		
Credits	1.5 credits		
Prerequisites required and recommended for joining this module	/		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	By studying this course, students can understand the basic principles and development history of computers, master basic Python programming skills, understand the underlying logic and general methods of programming, and have the ability to use programming languages to solve	R1

		general problems.	
	CLO2	Possess certain programming skills, and be able to select and use appropriate information technology tools, programming languages, engineering tools and simulation software to solve complex engineering problems in the field of electrical engineering.	R1
	CLO3	Develop logically clear and creative computer thinking.	R5
content	Interdisciplinary integration is the only way to cultivate compound talents to meet the needs of national social development, and Python Programming is a representative course to promote interdisciplinary development. Through the teaching of computer basics, Python basics and common python practical cases, this course allows electrical students to establish basic computer thinking, and reserve a powerful tool for subsequent professional learning, subject competitions, thesis writing, internship and employment. This syllabus only contains experimental teaching, and theoretical teaching is stipulated in accordance with the outline of "Python Programming". Teaching content: Project 1 Python environment configuration and usage experiment (weight 2/18, level: understanding + application). Project 2 Comprehensive Practice Experiment of Basic Python Syntax (Weight 2/18, Level: Understanding + Application). Project 3 Python process control experiment (weight 2/18, level: understanding + application). Project 4 Python Drawing and Scientific Computing Experiment (Weight 2/18, Level: Understanding + Application). Project 5 Python Control Hardware Experiment (Weight 2/18, Level: Understanding + Application). Project 6 Text Data Mining and Visualization Experiment (Weight 4/18, Level: Understanding + Application). Project 7 School LOGO Drawing and Design Experiment (Weight 4/18, Level: Understanding + Application).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting		

	for 50% of the overall evaluation score. Mainly assess the students' homework experiment reports. (2) Final assessment, full score of 100 points, accounting for 50% of the total evaluation score. The teaching content is mainly assessed through computer-based examinations, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Song Tian, Li Xin, Huang Tianyu. Fundamentals of Python Language Programming, 2nd Edition. Higher Education Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Power communication technology

Module Name	Power communication technology		
The semester in which this module is taught	Semester 4		
Module Leader	Cao Zhe, Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Teacher-centered methods: teaching method, case teaching, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical methods: simulation experimental method, project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-class homework, pre-class preview, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Power system steady-state analysis, power system transient analysis, electrical part of power plant/substation, sensor technology, power system relay protection principle, power system automatic device		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Implement relevant national standards, be familiar with the relevant basic knowledge in national standards, and understand technical standards, intellectual property rights, industrial policies, laws and regulations and enterprise	R5

		management systems related to electrical engineering.	
	CLO2	For complex electrical engineering problems, we can select and use appropriate, mature and reliable technical solutions, and select appropriate instruments and equipment, information processing tools, engineering tools and software for analysis and calculation.	R6
	CLO3	Understand the impact of electrical engineering on public safety and health and the social responsibility of environmental protection, and consciously fulfill responsibilities in engineering practice.	R7、R8
content	In the context of the construction of smart grid and energy Internet, the application of information and communication technology in the development of smart grid business is introduced, and power communication technology involves the intersection of strong and weak currents. Smart grids built around "higher grid reliability, better environmental performance, and stronger user choice" make extensive use of modern industrial technology and have become a major project to promote the progress of human society. This course cultivates students' ability to analyze and solve problems by studying the basic theories, basic knowledge and basic skills of intelligent substations and distribution networks, and prepares students for the necessary foundation for working in power systems and related fields. Teaching content: Chapter 1 Overview of smart grids (weight 2/36, level: memory + understanding). Chapter 2 Smart Grid Service Informatization and Architecture (Weight 4/36, Level: Memory, Understanding + Application). Chapter 3 Smart Grid Information and Communication Technology and Standards (Weight 4/36, Level: Memory, Understanding + Application). Chapter 4 Information and communication technology for new energy generation (weight 2/36, level: understanding + application). Chapter 5 Information and communication technology for intelligent power transmission and transformation (weight 2/36, level:		

	understanding + application). Chapter 6 Information and communication technology for intelligent power distribution (weight 4/36, level: understanding + application). Chapter 7 Smart Grid Dispatching Information and Communication Technology (Weight 2/36, Level: Understanding + Application). Chapter 8 Information and communication technology in the electricity market (weight 2/36, level: understanding + application). Chapter 9 Smart grid information security (weight 2/36, level: understanding + application). Experimental (Practice) Project: Experiment 1 Generator set SCADA experiment (weight 2/36, level: application + analysis). Experiment 2 Automatic Power Generation Control (AGC) Experiment of Generator Set (Weight 2/36, Level: Application + Analysis). Experiment 3 System power monitoring and load curve mapping (weight 2/36, level: application + analysis). Experiment 4 Telekinesis control and signal acquisition of circuit breaker (weight 2/36, level: application + analysis). Experiment 5 Comprehensive automatic adjustment of substation voltage reactive power (weight 2/36, level: application + analysis). Experiment 6 Upper computer monitoring system experiment (weight 2/36, level: application + analysis).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the

	achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Zhang Tiefeng, editor-in-chief. Smart grid information and communication technology. Beijing: China Electric Power Press, 2022. 2.Tang Liangrui et al. eds. Smart grid communication technology. Beijing: China Electric Power Press, 2019. 3.Yang Lishui et al., eds. Basic knowledge of smart grid. Beijing: China Electric Power Press, 2021. 4.Guo Moufa, editor-in-chief. Distribution Network Automation Technology (2nd Edition).Beijing: China Electric Power Press, 2020. 5.Wang Xianping, editor-in-chief. Operation technology of substation integrated automation system. Beijing: China Electric Power Press, 2018. 6.Lin Ye, editor-in-chief. Principle of secondary system and field practical technology of intelligent substation. Beijing: Publisher of China Electric Power Press, 2020. 7.Liu Zhenya, editor-in-chief. Smart grid technology. Beijing: China Electric Power Press, 2019.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Electrical control and PLC technology

Module Name	Electrical control and PLC technology		
The semester in which this module is taught	Semester 4		
Module Leader	Yang Lin, Zhao Xiong		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: project-based problem learning, teaching seminars (including group discussions); Individualized approach: unit teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 126 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 4 hours per week, a total of 18 weeks, 72 hours, including: after-school homework, exam preparation time, etc		
Credits	4.5 credits		
Prerequisites required and recommended for joining this module	Circuit theory, analog electronic technology, digital electronic technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through this course, students will be familiar with the structural principles, uses, models and selection methods of commonly used control appliances. Understand and master the analysis and design methods of basic electrical control systems; Learn the basic principles of programmable controllers (PLCs), PLC command systems, and PLC programming methods.	R1

	CLO2	Have the ability to independently analyze general electrical control lines; master the basic principles of programmable controllers (PLCs); Familiar with the use of Siemens S7-200 SMART series PLCs and able to use the knowledge to solve electrical engineering control problems of medium or higher complexity.	R4、R5
	CLO3	It has a high level of cultural accomplishment, strong aesthetic ability and noble moral sentiments, and has a rigorous and scientific way of thinking and truth-seeking spirit.	R11
content	This course is a professional elective course for the undergraduate major of electrical engineering and automation, which is a highly practical technical application course, integrating traditional relay control technology with modern PLC control and industrial network technology. This course not only lays the foundation for graduation training and graduation design, but also plays an important role in enhancing students' adaptability and development and innovation ability in the design, installation and commissioning of electrical control. This syllabus only contains theoretical teaching, and practical teaching is implemented in accordance with the outline of "Electrical Control and PLC Technology Experiment". Teaching content: Chapter 1 Commonly used low-voltage electrical appliances (weight 4/54, level: memory + understanding). Chapter 2 Basic Electrical Control Circuits (Weight 10/54, Level: Memory + Understanding + Application). Chapter 3 Overview of Programmable Controllers (Weight 4/54, Level: Memory + Understanding). Chapter 4 S7-200 SMART Interface and Configuration (Weight 4/54, Level: Memory + Understanding + Application). Chapter 5 Chapter 5 STEP 7-Use of Micro/WIN SMART Programming Software (Weight 4/54, Level: Application) Chapter 6 Basic Instructions and Applications of S7-200 SMART PLC (Weight 8/54, Level: Memory + Understanding + Application). Chapter 7 PLC Programming of Typical Control Links (Weight 8/54, Level: Application + Analysis + Evaluation + Creation). Chapter 8 PLC Function Instructions and Network Communication (Weight 4/54, Level: Memory + Understanding + Application). Chapter 9 Use of SMART LINE (Weight 4/54, Level: Memory + Understanding + Application). Chapter 10 PLC Control System Design and Application Examples (Weight 4/54, Level: Application + Analysis + Evaluation + Creation).		
Assessment form	1. The course assessment consists of process assessment and final		

	assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Huang Yonghong, editor-in-chief, "Electrical Control and PLC Application Technology - Siemens S7-200 SMART PLC", 3rd edition. Machinery Industry Press, 2021.
Version number	V2022, the major version will take effect in September 2022

Electrical control and PLC technology experiment

Module Name	Electrical control and PLC technology experiment		
The semester in which this module is taught	Semester 4		
Module Leader	Yang Lin, Zhao Xiong		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Interaction method: project-based problem learning Individualized Approach: Computer-Assisted Teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 42 hours Teaching hours: 2 hours per week, 9 weeks in total, 18 hours Self-study hours: 3 hours per week, 8 weeks in total, 24 hours, including: after-school homework, exam preparation time, etc		
Credits	1.5 credits		
Prerequisites required and recommended for joining this module	Circuit theory, analog electronic technology, digital electronic technology, electrical control and PLC technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Through this course, students will be familiar with the structural principles, uses, models and selection methods of commonly used control appliances. Understand and master the analysis and design methods of basic electrical control systems; Learn the basic principles of programmable controllers (PLCs), PLC command systems, and PLC programming methods.	R2
	CLO2	Have the ability to independently analyze general electrical control lines; master the basic principles of programmable controllers (PLCs); Familiar with the use of Siemens S7-200 SMART series PLCs and able to use the knowledge to solve electrical engineering control problems of medium or	R3

		higher complexity.	
	CLO3	It has a high level of cultural accomplishment, strong aesthetic ability and noble moral sentiments, and has a rigorous and scientific way of thinking and truth-seeking spirit.	R9
content	This course is a professional elective course for the undergraduate major of electrical engineering and automation, it is a highly practical technical application course, and is a supporting course of "Electrical Control and PLC Technology". Through a series of typical experimental designs, students' understanding of electrical control and PLC technology can be enhanced, and the ability to solve moderately difficult electrical control problems can be gradually cultivated through experimental reinforcement. This syllabus only contains experimental teaching, and theoretical teaching is carried out in accordance with the outline of "Electrical Control and PLC Technology". Teaching content: Experiment 1 Basic logic instructions (weight 2/18, level: understanding + application) Experiment 2 Disc speed control (weight 2/18, level: understanding + application) Experiment 3 Intersection Traffic Light Control (Weight 2/18, Level: Understanding + Application) Experiment 4 Transmission Line Control (Weight 2/18, Level: Understanding + Application) Experiment 5 Mixing Tank Control (Weight 2/18, Level: Understanding + Application) Experiment 6 Answering Machine Control (Weight 4/18, Level: Understanding + Application) Project 7 Experiment on Automatic Direction Selection and Positioning Control of Trolley (4/18, Level: Understanding + Application)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 50% + final assessment × 50% (1) Procedural assessment, scored on a 100-point system, accounting for 50% of the overall evaluation score. The main assessment is the completion of students' experimental reports. (2) Final assessment, full score of 100 points, accounting for 50% of the		

	total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Huang Yonghong, editor-in-chief, "Electrical Control and PLC Application Technology - Siemens S7-200 SMART PLC", 3rd edition. Machinery Industry Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

High voltage technology

Module Name	High voltage technology		
The semester in which this module is taught	Semester 5		
Module Leader	Cao Zhe, Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Teacher-centered methods: teaching method, demonstration method; Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Practical methods: simulation experimental method, project-based learning		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-class homework, pre-class preview, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, College Physics, Circuit Theory, Engineering Electromagnetic Field, Electrical Engineering, Power Electronics Technology, Power System Analysis		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Objectively analyze and evaluate the development of new electrical products, new technologies, new processes, and the impact of electrical production on society, health, safety, law, and culture, and understand the	R2

		responsibilities they should bear.	
	CLO2	Students can use the basic knowledge and scientific methods of mathematics, natural sciences, and electrical engineering to conduct simulations, analyze and explore the mechanism and law of key parameters in complex electrical systems, gradually express solutions to complex electrical engineering problems, and analyze their rationality.	R6
	CLO3	Understand the impact of electrical engineering on public safety and health and the social responsibility of environmental protection, and consciously fulfill responsibilities in engineering practice.	R7、R8
content	High voltage technology is a discipline that studies the insulation and operation problems of electrical equipment, and is a professional course with both system theory and strong practice. This course essentially reflects the phenomenon of dielectrics in strong electric fields. Engineers and technicians engaged in the design, installation, commissioning and operation of power systems will encounter the problem of high voltage technology. This course discusses the insulation of electrical equipment and the overvoltage of the power system and the corresponding protective measures, so that students have a more comprehensive understanding of high voltage technology, which is conducive to the improvement of their practical ability and lays the necessary professional foundation for future research and technical work in the field of high voltage engineering. Teaching content: Item 1 Insulating properties of gas dielectrics (weight 2/36, level: memory + understanding). Item 2 Insulation characteristics of liquid and solid dielectrics (weight 2/36, level: memory + understanding). Item 3 Insulation of commonly used electrical equipment (weight 2/36, level: memory + understanding). Item 4 Wave process in the line (weight 2/36, level: understanding + application + analysis).		

	Item 5 Wave process in winding (weight 2/36, level: understanding + application + analysis). Project 6 Analysis of wave process exercises (weight 2/36, level: understanding + application + analysis). Item 7 Lightning and lightning protection devices (weight 2/36, level: understanding + application + analysis). Item 8 Grounding technology and grounding device (weight 2/36, level: understanding + application + analysis). Project 9 Analysis of lightning protection grounding exercises (weight 2/36, level: understanding + application + analysis). Project 10 Lightning protection of transmission lines (weight 2/36, level: understanding + application + analysis). Project 11 Lightning protection of power plants (substations) (weight 2/36, level: understanding + application + analysis). Item 12 Lightning protection protection of rotating motors (weight 2/36, level: understanding + application + analysis). Item 13 Power frequency overvoltage (weight 2/36, level: understanding + analysis). Item 14 Resonant overvoltage (weight 2/36, level: understanding + analysis). Item 15 Operating overvoltage (weight 2/36, level: understanding + analysis). Item 16 Power System Insulation (Weight 2/36, Level: Understanding + Analysis). Item 17 Insulation level of substations and overhead transmission lines (weight 2/36, level: understanding + analysis). Item 18 Typical Question Analysis (Weight 2/36, Level: Understanding + Analysis).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score.

	(2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of test papers, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Zhao Zhida, editor-in-chief. High Voltage Technology (4th Edition).Beijing: China Electric Power Press, 2023. 2.Wu Guangning, editor-in-chief. High Voltage Technology (2nd Edition). Beijing: Machinery Industry Press, 2017. 3.Lin Fuchang, editor-in-chief. High Voltage Engineering (2nd Edition). Beijing: China Electric Power Press, 2011. 4.Liang Xidong et al. Editors-in-Chief. High Voltage Engineering (2nd Edition). Beijing: Tsinghua College Press, 2019. 5.Zhang Yichen, editor-in-chief. High Voltage Technology (3rd Edition). Beijing: China Electric Power Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

High voltage technology experiment

Module Name	High voltage technology experiment		
The semester in which this module is taught	Semester 5		
Module Leader	Cao Zhe, Meng Yuanyuan		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Interaction methods: inquiry-based problem learning, teaching discussion (including group discussion), questioning; Individualized method: unit teaching, independent design Practical method: experimental method		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 21 hours Teaching hours: 1 hour per week, 9 weeks in total, 9 hours Self-study hours: 1.5 hours per week, a total of 8 weeks, 12 hours, including: after-class experiments, exam preparation time, etc		
Credits	0.75 credits		
Prerequisites required and recommended for joining this module	Circuit theory, electrical engineering, engineering electromagnetic field, power system analysis		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand technical standards, intellectual property rights, industrial policies, laws and regulations, and corporate management systems related to electrical engineering.	R1
	CLO2	Correctly collect and organize experimental data, correlate, model, analyze and interpret experimental results, and obtain reasonable and	R4

		effective conclusions.	
	CLO3	Engineering foundation and professional knowledge can be used to analyze and optimize electrical engineering problems, optimize solutions to electrical engineering problems through model comparison and synthesis, and complete system design.	R6、R8
content	High-voltage technology experiments are an important part of the field of high-voltage engineering. High voltage technology is closely related to pulsed power technology, laser technology, high-voltage accelerator and high-energy physics and other technologies, and constantly absorbs the achievements of other disciplines, especially new scientific and technological fields, to promote its own development, and also promotes the development of power transmission and other scientific and technological fields, showing its strong vitality. This course describes the high voltage test equipment and corresponding measuring devices, including the test of AC high voltage, DC high voltage, lightning impulse voltage, operating impulse voltage and impulse current, the measurement of dielectric loss factor and internal partial discharge of the medium, cultivates students' test skills in the field of high voltage and insulation technology, and the thinking of discovering, analyzing and solving problems, laying the foundation for engaging in engineering design, operation and maintenance and scientific research in the field of electrical engineering and automation after graduation. Teaching content: Experiment 1 Measurement of insulation resistance, absorption ratio and leakage current (weight 1/9, level: application + analysis). Experiment 2 The loss of the medium was tested by the Xilin bridge measurement method (weight 1/9, level: application + analysis). Experiment 3 Needle tip and needle plate breakdown experiment (weight 1/9, level: application + analysis). Experiment 4 Chromatographic analysis of dissolved gases in insulating oil (weight 1/9, level: application + analysis). Experiment 5 Generation and measurement of power frequency AC high voltage (weight 1/9, level: application + analysis).		

	Experiment 6 Generation and measurement of DC high voltage (weight 1/9, level: application + analysis). Experiment 7 Generation and measurement of impact high voltage (weight 1/9, level: application + analysis). Experiment 8 Preliminary design of lightning protection scheme for substation (weight 2/9, level: application + analysis + creation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: Overall course evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' experimental reports and independent learning. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of experimental reports, and the achievement of course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Self-compiled experimental instructions and experimental reports. 2. Zhou Lijun and Wu Guangning, editors-in-chief. High voltage technology experiment. Chengdu: Southwest Jiaotong College Press, 2011. 3. Huang Zhixian, editor-in-chief. High voltage technology application. Beijing: China Hydropower Press, 2017. 4. Chen Changyu et al. eds. High Voltage Test Technology (4th Edition). Beijing: Tsinghua College Press, 2020. 5. Dai Kejie et al. eds. High Voltage Technology Experimental Instructions. Chongqing: Chongqing College Press, 2018. 6. Sun Changhai, editor-in-chief. High voltage technology experimental tutorial. Dalian: Dalian College of Technology Press, 2016.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according

	to ECTS

Secondary circuit of the power plant substation

Module Name	Secondary circuit of the power plant substation		
The semester in which this module is taught	Semester 5		
Module Leader	Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: teaching method (PPT, video demonstration), case teaching, questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical methods: project practice, practice method.		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours. Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc.		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Circuit Theory, Power Electronics Technology, Electrical Engineering		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	master the graphic symbols and text symbols of common components of the secondary circuit, and master the wiring methods of transformers; master the working principle of isolation switch control and misoperation of the lockout loop; Master the composition and working principle of the synchronous device, and master the synchronous operation steps; master the composition and working principle of the full signal loop; master the composition and operation process of the basic control signal circuit of the light monitoring and sound monitoring circuit breaker; Master the basic requirements of the	R1

		circuit breaker control loop, master the automatic reset control switch of LW2 series; Master the configuration principles of measuring instruments in the measurement loop.	
	CLO2	Able to analyze the wiring diagram of the secondary system; It can design the secondary circuit of the conventional power plant substation; Develop the ability to analyze and solve problems independently.	R3
	CLO3	cultivate a serious and responsible work attitude and a rigorous and meticulous work style; Cultivate scientific thinking and truth-seeking spirit.	R5、R11
content	This course is one of the professional elective courses of electrical engineering and its automation, and is a professional course with strong theoretical and practical content. This course starts from the actual situation of our country's power grid and power plant, while focusing on the discussion of basic professional theoretical knowledge, closely related to the actual production, strengthening the understanding and mastery of field application knowledge, for the purpose of improving students' ability to independently analyze and solve problems, cultivating students' ability to recognize drawings and hands-on operation of the secondary system of the power plant substation, and on this basis, carry out the design of the secondary circuit, understand the new technologies and new equipment that appear in the secondary system and their applications, and be trained in the ability to analyze and solve practical engineering , laying the necessary foundation for students to engage in their professional fields after graduation. Teaching content: Chapter 1 Basic knowledge of quadratic circuits (weight 4/36, level: memory). Chapter 2 Transformer and its secondary loop (weight 6/36, level: memory + understanding) Chapter 3 Measurement Loop (Weight 4/36, Level: Memory + Understanding) Chapter 4 Control and Signal Loop of Circuit Breaker (Weight 6/36, Level: Understanding + Application) Chapter 5 Signal Loop (Weight 4/36, Level: Understanding + Application) Chapter 6 Control and Latching Loop of Disconnect Switches (Weight 4/36, Level: Understanding + Application)		

	Chapter 7 Synchronous System (Weight 4/36, Level: Memory + Comprehension) Chapter 8 Transformer Secondary Circuit (Weight 2/36, Level: Memory + Understanding) Chapter 9 Operating the Power Supply (Weight 2/36, Level: Memory + Understanding)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a 100-point system, accounting for 40% of the total evaluation score. It mainly assesses the completion of students' homework, 242 independent learning, midterm exams and participation in discussion activities. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book form, and the achievement of the curriculum knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1 Lin Shan, editor-in-chief. Electrical secondary circuit. China Electric Power Press, 2019. 2. Compiled by the Human Resources Department of State Grid Corporation. Secondary circuit. China Electric Power Press, 2010. 3. He Yonghua, editor-in-chief. Secondary circuits of power plants and substations. China Electric Power Press, 2012.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Electrical engineering CAD technology

Module Name	Electrical engineering CAD technology		
The semester in which this module is taught	Semester 5		
Module Leader	Yang lin		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interaction methods: project-based problem learning; Individualized Approach: Computer-Assisted Teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Circuit theory, engineering drawing, analog electronic technology, digital electronic technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the basic knowledge of electrical drawings, basic drawing skills, national standards, bullet points, etc.; Familiar with the basic drawing process and drawing standards of electrical circuit diagrams; Able to use Auto CAD software to design electrical graphics according to enterprise or industry requirements.	R3
	CLO2	Proficient in operating AutoCAD software; be able to read and draw various electrical engineering drawings; Familiar with the drawing, editing and dimensioning of 2D graphics, as well as the establishment and use of blocks. be able to understand the three views; Memorize the general electrical symbols in AutoCAD software; Proficient in using AutoCAD software to design	R5

		and draw common electrical engineering drawings.	
	CLO3	cultivate students' ability to independently analyze and solve problems; Cultivate students' meticulous and rigorous work attitude.	R5
content	The electrical engineering CAD technology course is both systematic and practical, aiming to cultivate students' ability to read and draw more complex electrical engineering drawings, and to be proficient in using AutoCAD software to draw various electrical engineering drawings. This course mainly includes the engineering principles of electrical CAD systems, the technical characteristics of contemporary CAD software, and the main contents of EES software. and preparatory knowledge before drawing, drawing settings, drawing flat drawings, drawing engineering drawings,otherUsage of drawing commands and editing commands, drawing of part drawings, methods to improve drawing efficiency, drawing of assembly drawings, printout of drawings, 3D solid modeling, and generation of engineering drawings by 3D models. On this basis, electrical engineering drawings, substation engineering drawings, transmission engineering drawings, building electrical, factory electrical control drawings, electronic circuit diagrams, communication circuit diagrams, etc. are introduced. Teaching content: Chapter 1 Electrical CAD Fundamentals (weight 8/36, level: understanding + application + analysis + creation). Chapter 2 Basic Representation Methods of Electrical Diagrams (Weight 8/36, Level: Understanding + Application + Analysis + Creation). Chapter 3 Basic Electrical Diagram (weight 8/36, level: understanding + application + analysis + creation). Chapter 4 AutoCAD Basic Drawing Overview (Weight 12/36, Level: Understanding + Application + Analysis + Creation).		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test in the form of closed-book tests, and the achievement of course knowledge, ability and literacy goals is evaluated.		

Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. Liu Zengliang, editor-in-chief. Electrical Engineering CAD, 2nd Edition, China Water Conservancy and Hydropower Press, August 2016. 2. CAD/CAM/CAE Technology Alliance. AutoCAD Electrical Drawing Examples, Tsinghua College Press, July 2016.
Version number	V2022, the major version will take effect in September 2022 V2022.1, Update point: Credits and workload are calculated according to ECTS

Power plant power part

Module Name	Power plant power part		
The semester in which this module is taught	6th semester		
Module Leader	Zhou Liming		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: teaching method (PPT, video demonstration), case teaching, questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Practical methods: project practice, practice method.		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours. It includes 34 hours of theory and 2 hours of experiment. Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc.		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, Electrical Part of Power Plant Substations		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Understand the power generation process of different types of power plants; master the main power equipment structure, system composition and operation mode of thermal power plants, hydroelectric power plants and nuclear energy power plants; Proficient in the working principles of thermal power plants, hydroelectric power plants and nuclear power plants; Learn how thermal power plants, hydroelectric generators and nuclear power plants operate and regulate.	R6
	CLO2	Possess the relevant professional knowledge and	R7

		skills required for the design, installation, commissioning, operation and maintenance of thermal power plants, hydroelectric power plants and nuclear power plants; Have the ability to comprehensively use the scientific theories and technical means learned to design power equipment for thermal power plants, hydroelectric power plants and nuclear power plants. Have the ability to systematically express, model, analyze, solve and demonstrate thermal power plants, hydroelectric power plants and nuclear power plants; Master the basic methods of literature search, data inquiry and the use of modern information technology to obtain relevant information.	
	CLO3	full of enthusiasm and strong desire for knowledge; seeking truth from facts, having the confidence and determination to overcome difficulties; Comply with working hours, abide by operating specifications, and infiltrate the 5S system of the enterprise; be able to carry out reasonable division of labor and cooperation according to work tasks, and have a strong team spirit; Be able to correctly describe work tasks and requirements, and make work summaries and speeches; Dare to put forward different opinions from others, and have the courage to correct or give up their own wrong views; Willing to test and judge various technical problems through personal experience	R7
content	The Power Plant component is an elective course for non-thermal majors. This book is divided into three relatively independent parts: the power part of thermal power plants, the power part of hydroelectric power plants, and the power part of nuclear power plants. The theoretical basis of the power part of the power plant, the main power equipment structure, working principle, system composition and operation mode are expounded respectively. By studying this course, students should comprehensively and systematically grasp the basic theory of the mutual conversion between thermal energy and mechanical energy; and understand the basic knowledge of its working principle, the composition, function, structural characteristics and working principle of the main power equipment; Familiar with the		

	production process of conventional power generation and new energy power generation; It has the ability to analyze the efficiency of the safe and economical operation of the power part of the power plant and energy conversion and its simple calculation ability. Teaching content: Chapter 1 Basic Concepts and Basic Laws of Thermodynamics (Weight 4/36, Level: Memory). Chapter 2 Basic Principles of Heat Transfer (Weight 4/36, Level: Memory + Understanding) Chapter 3 Boiler Equipment (Weight 4/36, Level: Memory + Comprehension) Chapter 4 Steam Turbine Equipment (Weight 6/36, Level: Understanding + Application) Chapter 5 Development and Utilization of Hydropower (Weight 4/36, Level: Understanding + Application) Chapter 6 Selection of Installed Capacity of Hydropower Plants (Weight 6/36, Level: Understanding + Application) Chapter 7 Main Hydraulic Buildings and Power Equipment of Hydropower Plants (Weight 4/36, Level: Memory + Understanding) Chapter 8 Power Equipment and Operation of Nuclear Power Plants (Weight 4/36, Level: Memory + Understanding)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a 100-point system, accounting for 40% of the total evaluation score. It mainly assesses the completion of students' homework, independent learning, phased tests and midterm examinations. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test open book, and the achievement of the course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1 Guan Jinfeng. Power plant power part. China Electric Power Press, reprinted in May 2021. 2. Xia Yong. Zhang Zheng, editor-in-chief. Power Plant Power Part, Machinery Industry Press, August 2017 3. Yan Junjie. Power Plant Thermal System and Equipment, Xi'an Jiaotong College Press, January 2019.

Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Power system automatics

Module Name	Power system automatics		
The semester in which this module is taught	6th semester		
Module Leader	Wang Jiachen		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Teacher-centered approach: teaching, inquiry, discussion; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Methods of practice: project practice;		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Advanced Mathematics, College Physics, Circuit Theory, Electrical Measurement Technology, Introduction to Smart Grids		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Master the basic structure of automatic power system devices, and understand the principles of data collection and processing. Master the working principle of automatic parallel device and generator excitation control system of the power system, and have certain ability to analyze and design automatic devices of the power system. Learn the basic principles and applications of low-frequency load shedding and other safety automatic controls. lay the foundation for students to participate in practical engineering application work;	R1
	CLO2	Have the relevant professional knowledge and	R3

		skills required for power production, operation and control, such as active power control of power plant units, grid connection synchronization, reactive voltage control during transmission operation, and frequency stability control of power systems; Master the basic theoretical knowledge of electrical engineering and its automation, and understand the cutting-edge development status and trend of electrical control equipment; Have the ability to comprehensively use the scientific theories and technical means learned to design electrical systems, components and processes. Have the ability to systematically express electrical engineering problems, establish models, analyze and solve them, and demonstrate. Master the basic methods of literature search, data query and the use of modern information technology to obtain relevant information.	
	CLO3	Let students establish a solid awareness of safety first and electricity conservation, ensure personal and property safety, and improve the efficiency of electrical equipment. Cultivate students to be knowledgeable, useful, protective, and responsible; cultivate students' dedication, happiness, diligence and entrepreneurial spirit; Cultivate students with the ability to find, solve and troubleshoot problems; Cultivate students with the ability to consult information, decompose problems, ask questions and summarize, and calculate experiments.	R6
content	Through this course, students can understand the basic content, role and development prospect of power system automation, and master the principle of power system safety control device; Familiar with the working principle of synchronous generator automatic parallel device, synchronous generator excitation system and excitation regulator, the dynamic behavior of primary and secondary regulation of power system frequency, and analyze the adjustment criteria; Master the working principle of automatic input device for backup power supply, automatic reclosing device for transmission lines, and automatic load reduction device according to frequency. It lays a solid foundation for students to use conventional automatic devices correctly and improve their ability to		

	analyze and solve problems. Teaching content: Chapter 1 Automatic Devices and Their Data Acquisition and Processing (Weight 6/36, Level: Understanding) Chapter 2 Automatic Juxtaposition of Synchronous Generators (Weight 10/36, Level: Knowledge - Analysis) Chapter 3 Automatic Control System for Synchronous Generator Excitation (Weight 6/36, Level: Knowledge - Analysis) Chapter 4 Frequency Characteristics of Power Systems (Weight 6/36, Level: Knowledge - Analysis) Chapter 5 Automatic Adjustment of Power System Frequency and Active Power (Weight 6/36, Level: Application) Chapter 6 Automatic Low-frequency Load Reduction and Other Safety Automatic Control Devices for Power Systems (Weight 2/36, Level: Application)
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the written test open book, and the achievement of the course knowledge, ability and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Principles of Automatic Devices in Power Systems", edited by Yang Guancheng, published by China Electric Power Publishing House in 2012. 2. "Automatic Devices of Power Systems", edited by Huo Huizhi and Zhao Qing, Chongqing College Press, published in 2019.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Sensor technology

Module Name	Sensor technology		
The semester in which this module is taught	6th semester		
Module Leader	Lu Xiaolei		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interaction methods: inquiry-based problem learning; Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	College physics, circuit theory, analog electronic technology, digital electronic technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Familiar with the basic knowledge and basic methods of non-electrical detection and measurement; Master the basic principles and classification of sensors; Master the working principle, basic structure, measurement circuit, working characteristics and performance parameters of commonly used sensors; Master the typical applications of various sensors, understand the development trend of sensors and their wide application in industrial production and science and technology.	R3
	CLO2	be able to recognize and identify various commonly used sensors, and be able to correctly use instruments and instruments to judge the	R4

		performance of sensors; It can reasonably select sensors to form various control and detection electronic circuits according to needs, and can give reasonable sensor configuration schemes according to specific measurement needs.	
	CLO3	Be able to keep up with the development of sensor technology, grasp the development trend of sensors, and be familiar with and apply new sensors.	R7
content	Sensor technology is a highly applied professional elective course. Through the study of this course, students can initially master the basic knowledge of detection technology, including the physical concepts of sensors with different principles, commonly used sensor measurement circuits and typical applications of various types of sensors. It has the ability to select and apply various types of sensors. It can solve specific problems in engineering inspection. Cultivate students' scientific literacy and improve students' ability to analyze and solve problems. Teaching content: Chapter 1 Basic Concepts, Compositions and Classifications of Sensors (Weight 2/36, Level: Memory). Chapter 2 Detection Basics and Basic Characteristics of Sensors (Weight 2/36, Level: Memory - Understanding). Chapter 3 Resistive Sensors (Weight 4/36, Level: Memory + Understanding + Application + Analysis). Chapter 4 Inductive Sensors (Weight 2/36, Level: Memory - Understanding). Chapter 5 Capacitive Sensors (Weight 4/36, Level: Memory + Understanding + Application + Analysis). Chapter 6 Piezoelectric sensors (weight 4/36, level: memory + understanding + application + analysis). Chapter 7 Magnetically Sensitive Sensors (Weight 4/36, Level: Memory + Understanding + Application + Analysis). Chapter 8 Thermoelectric sensors (weight 4/36, level: memory + understanding + application + analysis). Chapter 9 Photoelectric sensors (weight 4/36, level: memory + understanding + application + analysis). Chapter 10 Radiation and Wave Sensors (Weight 2/36, Level: Memory - Understanding). Chapter 11 Air and Moisture Sensors (Weight 2/36, Level: Memory - Understanding). Chapter 12 Intelligent and Wireless Sensors (Weight 2/36, Level: Memory - Understanding).		
Assessment form	1. The course assessment consists of process assessment and final		

	assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of pen opening, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	1. "Sensors and Detection Technology", edited by Hu Xiangdong and others, Machinery Industry Press, published in 2021. 2. "Sensors and Detection Technology", edited by Xu Kejun, Electronic Industry Press, published in 2021. 3. "Sensors and Detection Technology", edited by Chen Jie, Cai Tao and Huang Hong, Higher Education Press, published in 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Automation engineering design and application

Module Name	Automation engineering design and application		
The semester in which this module is taught	6th semester		
Module Leader	deal with		
language	Chinese		
Relationship to the curriculum	Professional electives		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interaction methods: inquiry-based problem learning; Individualized Approach: Computer-Assisted Teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 126 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 4 hours per week, a total of 18 weeks, 72 hours, including: after-class homework, work production time, etc		
Credits	4.5 credits		
Prerequisites required and recommended for joining this module	Electrical control and PLC technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Familiar with the overall implementation process of automation engineering projects, clarify the core tasks in each process link; Understand the basic knowledge of project management such as automation engineering team formation, personnel management, project promotion, and real-time control.	R1
	CLO2	master the use of typical automation software and hardware in practical engineering tasks; Have the ability to formulate schemes and implement automation projects.	R2、R3
	CLO3	It has a high level of cultural accomplishment,	R11

		strong aesthetic ability and noble moral sentiments, and has a rigorous and scientific way of thinking and truth-seeking spirit.	
content	By studying this course, students can master the overall implementation process of automation engineering projects and clarify the core tasks in each process link. Master the use of typical automation software and hardware in practical engineering tasks. Understand the basic knowledge of project management such as automation engineering team formation, personnel management, project promotion, and real-time control; data analysis ability; Scheme formulation ability and automation engineering implementation ability. Teaching content: Chapter 1 Entering Automation Engineering (Weight 2/54, Level: Memory). Chapter 2 Bidding for Engineering Projects (Weight 4/54, Level: Memory - Comprehension) Chapter 3 Automation Engineering Project Approval (Weight 2/54, Level: Memory). Chapter 4 Data Analysis and Control Plan of Project Approval Project (Weight 8/54, Level: Understanding + Application). Chapter 5 Electrical Drawing Design of Project Approval (Weight 10/54, Level: Memory - Application). Chapter 6 Software Configuration and Programming of Project Approval (Weight 10/54, Level: Memory - Application). Chapter 7 Installation, commissioning, delivery, and transportation of project approval projects (weight 8/54, level: memory - application). Chapter 8 On-site implementation of project approval projects (weight 8/54, level: memory - application). Chapter 9 Completion of Automation Engineering Project (Weight 2/54, Level: Memory)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. It mainly assesses students' homework completion, independent learning, phased tests, experimental projects and midterm exams. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the form of classroom works, and the achievement of curriculum knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		

Read the list	1. "Design and Application of Automation Engineering", edited by Tian Libu, Chen Nanjiang, Lin Yanwen, Higher Education Press, published in 2021. 2. "Equipment Automation Engineering Design and Practice", edited by Xiao Weirong and Qi Rong, Machinery Industry Press, published in 2021. 3. "Design, Installation, Debugging and Fault Diagnosis of Automation Equipment and Engineering" edited by Yao Fulai and Tian Yinghui, Machinery Industry Press, published in 2018. 4. "Automation Equipment and Production Line Design", edited by Rui Yannian, Science Press, published in 2021. 5. "Automatic Line Control Technology" edited by Yao Fulai and Zhen Jiujun, Higher Education Press, published in 2020.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

EDA technical foundation

Module Name	EDA technical foundation		
The semester in which this module is taught	Semester 1		
Module Leader	Li Xingyuan		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, questioning, demonstrations; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized Approach: Computer-Assisted Teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 84 hours Teaching hours: 2 hours per week, 18 weeks in total, 36 hours Self-study hours: 3 hours per week, a total of 16 weeks, 48 hours, including: after-school homework, exam preparation time, etc		
Credits	3 credits		
Prerequisites required and recommended for joining this module	Circuit theory, digital electronic technology basics, analog electronics technology basics,		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Implement relevant national standards, be familiar with the relevant basic knowledge in national standards, and master the use of EDA software platform; Master the preparation of EDA design, that is, how to summon the creation of EDA and how to create the project; master the use of Lichuang EDA and the application of simulation; Master circuit schematic design.	R1
	CLO2	using Lichuang EDA platform for electronic circuit simulation; the Lichuang EDA platform is used for circuit schematic simulation; Use the Lichuang	R2、R3

		EDA platform for PCB design.	
	CLO3	Cultivate a serious and responsible work attitude and a rigorous and meticulous work style. Under the constraints of social, health, safety, law, culture, and environment, the feasibility of the design scheme can be studied through technical and economic evaluation.	R5
content	Through this course, students can master the design theory and design process of electronic design automation, be familiar with the operation of the EDA software platform and master the design methods of electronic systems. It lays the foundation for future circuit board design, and plays an important role in cultivating students' innovative thinking ability, comprehensive experimental ability, system development ability, teamwork ability, scientific thinking ability, establishing an engineering perspective that connects theory with practice, and improving students' ability to analyze and solve problems. Teaching content: Chapter 1 Introduction and Application of EDA in Teaching (weight 4/36, level: understanding). Chapter 2 Design Preparation (Weight 2/36, Level: Memory + Understanding + Evaluation). Chapter 3 Schematic Design (Weight 8/36, Level: Memory + Understanding + Application). Chapter 4 PCB Design (Weight 6/36, Level: Memory + Understanding + Application). Chapter 5 Simulation Design (Weight 6/36, Level: Memory + Understanding + Application). Chapter 6 Common skills of EDA (weight 2/36, level: memory + understanding + application). Chapter 7 Instance Operation (Weight 8/36, Level: Memory + Understanding + Application.)		
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the form of works, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.		
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course		

Read the list	[1] Jiao Sumin. "EDA Technical Fundamentals". Beijing: Tsinghua College Press, 2009.08; [2] Li Jianbing. EDA Technology Basic Course. Beijing: National Defense Industry Press, 2009.05; [3] Self-compiled textbook. "Lichuang EDA Design Manual".2021.11.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Introduction to Electrical Engineering

Module Name	Introduction to Electrical Engineering		
The semester in which this module is taught	Semester 1		
Module Leader	Qiao Lin and Wang Jiachen		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, and questioning; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions);		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 42 hours Teaching hours: 1 hour per week, 18 weeks in total, 18 hours Self-study hours: 2 hours per week, a total of 12 weeks, 24 hours, including: after-school homework, exam preparation time, etc		
Credits	1.5 credits		
Prerequisites required and recommended for joining this module	not		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Fully understand the development history, status and role, theoretical system and application field of electrical engineering. Understand the professional characteristics, professional knowledge structure and application fields of electrical engineering, so as to guide the selection of majors, professional directions and courses.	R6
	CLO2	After learning the content of motors and electrical appliances, you should master their basic concepts, basic theories, and basic applications, and will perform simple calculations and analysis, and solve some simple practical problems. After learning the content of power electronics technology, you should master the basic concepts,	R8

		basic theories and basic applications of the four major transformations, and will be able to perform simple calculations and analysis, draw circuit diagrams, perform waveform analysis, and solve some simple practical problems; After learning the content of the power system and its automation technology, you should master its basic content, basic calculation methods, basic analysis methods, and basic applications, and will carry out simple calculations and analysis, and solve some simple practical problems. After learning the content of high voltage and insulation technology, you should understand the basic concepts, basic theories, and basic applications, and solve some simple practical problems. After learning the content of new electrical engineering technologies, you should understand the scope of content, the fields involved, and the development and application prospects. After learning all the knowledge, you can comprehensively summarize and apply the sub-disciplines, and form an overall understanding of the electrical engineering discipline.	
	CLO3	Cultivate students' ability to analyze and solve problems independently.	R11
content	Through the study of this course, college students of this major can have a more comprehensive understanding of the development history, status and role, theoretical system and application field of electrical engineering, which will help students understand the electrical engineering major, broaden students' horizons, and lay a solid foundation for the study and further in-depth study of the basic courses and professional courses of the follow-up majors of electrical engineering in the future. Teaching content: Chapter 1 Introduction (weight 2/18, level: understanding). Chapter 2 Fundamentals of Motors and Electrical Appliances (weight 4/18, level: memory + understanding + evaluation). Chapter 3 Power Electronics Technology (Weight 4/18, Level: Memory + Understanding + Evaluation). Chapter 4 Power System and Its Automation Technology (Weight 4/18, Level: Memory + Understanding + Evaluation). Chapter 5 High Voltage and Insulation Technology (Weight 2/18, Level: Memory + Understanding + Evaluation). Chapter 6 The weight of new technologies in electrical engineering is		

	2/18, level: memory + understanding + evaluation).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed in the form of course papers, and the achievement of course knowledge objectives, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Fan Yu. Introduction to Electrical Engineering. Beijing: Higher Education Press, 2021.06. [2] Jia Wenchao. Introduction to Electrical Engineering. Xi'an: Xidian College Press, 2014.10.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS

Principle and interface technology of monolithic microcomputer

Module Name	Principle and interface technology of monolithic microcomputer		
The semester in which this module is taught	Semester 4		
Module Leader	Li Xingyuan, Zhao Xiong, Yang Lin, Cao Zhe		
language	Chinese		
Relationship to the curriculum	Professional elective courses		
Teaching methods	Teacher-centered methods: lectures, case teaching, questioning, demonstrations; Interactive methods: inquiry-based problem learning, teaching and discussion (including group discussions); Individualized Approach: Computer-Assisted Teaching Method of practice: project practice		
Workload (including teaching hours and self-study hours)	Total workload (estimated): 126 hours Teaching hours: 3 hours per week, 18 weeks in total, 54 hours Self-study hours: 4 hours per week, a total of 18 weeks, 72 hours, including: after-school homework, exam preparation time, etc		
Credits	4.5 credits		
Prerequisites required and recommended for joining this module	Circuit theory, digital electronics technology, analog electronics technology, power electronics technology, automatic control principle, sensor technology		
Module objectives/expected learning outcomes	Course learning outcomes	description	Support graduation requirements
	CLO1	Help students familiarize themselves with the features, internal interface circuitry, and working principles of micropython microcontrollers. Learn the basic methods of programming, the basic syntax elements of Python language, basic data types, the control structure of programs, function and code reuse, and an overview of Python third-party libraries. master the use of human-computer interaction equipment, and learn to understand human-computer interaction	R1

		equipment by searching for information; master the thinking and method of sensor access to MCU, and can design the control system by itself and expand the function; Complete the related experiments based on the micropython experimental board ESP32PICO: buttons, LED lights, buzzer control, photoresist detection and input experiments, OLED display experiments, AD input and display experiments, DC motor and servo control experiments, Internet of Things WIFI control experiments, and clock comprehensive design experiments.	
	CLO2	Cultivate students' ability to apply MCUs in the fields of automation, detection technology, signal processing, and power transmission, and cultivate students' ability to design and develop microcontroller application systems.	R2、R3
	CLO3	To cultivate students' ability to think abstractly, they should not only be good at summarizing commonalities from personality, but also have a deep understanding of personality from commonalities; Cultivate students' basic ability to think, analyze and solve problems using the methodology of dialectical materialism.	R11
content	Through the teaching of this course, students can master the basic knowledge of the principle and application of microcontrollers, acquire the basic theories and basic skills of microcontroller application system design, and master the design, debugging methods and development steps of each main link of the microcontroller application system. Cultivate students' comprehensive ability to analyze and solve problems. It lays a solid foundation for students to study follow-up courses and engage in jobs related to microcontroller application technology after graduation. This course adopts the integrated arrangement of "teaching, learning and doing", which organically integrates theoretical teaching and practical teaching. Teaching content: Chapter 1 Overview of Microcontroller Basics (Weight 4/54, Level: Understanding). Chapter 2 Introduction to ESP32 Microcontroller (Weight 6/54, Level: Memory + Understanding + Evaluation). Chapter 3 Micropython language development knowledge (weight 4/54, level: memory + understanding + application). Chapter 4 Human-computer interaction equipment (weight 14/54, level:		

	memory + understanding + application). Chapter 5 Extended Interface Technology (Weight 12/54, Level: Memory + Understanding + Application.) Chapter 6 Overview of Internet of Things Technology (Weight 8/54, Level: Memory + Understanding + Application). Chapter 7 Design and Development of MCU Application Systems (Weight 6/54, Level: Memory + Understanding + Application).
Assessment form	1. The course assessment consists of process assessment and final assessment. 2. Grade evaluation: course overall evaluation score = process assessment × 40% + final assessment × 60% (1) Procedural assessment, scored on a percentage system, accounting for 40% of the total evaluation score. (2) Final assessment, with a full score of 100 points, accounting for 60% of the total evaluation score. The teaching content is mainly assessed through the form of works, and the achievement of course knowledge goals, ability goals and literacy goals is evaluated.
Study and exam requirements	The evaluation is based on a 100-point system, and 60 points are the passing score for this course
Read the list	[1] Zhang Yigang. Microcontroller Principle and Interface Technology (C51) (3rd Edition).People's Post and Telecommunications Publishing House, 2020.; [2] Zhou Xianghong. Microcontroller and application practice tutorial. Beihang College Press, 2018. [3] Lei Xuetang et al. Micropython Development and Practice. Beihang College Press, 2021.
Version number	V2022, the major version will take effect in September 2022 V2022.1. Update point: calculate credits and workload according to ECTS