



Module Descriptions for Electrical Engineering and Automation

CONTENTS

Psychological Health Education for College Students	1
Ideological and Moral Education and the Rule of Law	4
Conspectus of Chinese Modern History	7
Basic Principles of Marxism	12
An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics	15
An Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	18
Situation and Policy	21
Advanced Mathematics	24
Linear Algebra II	28
College English	31
Introduction to Environmental Science	37
Engineering Drawing	39
Probability Theory and Mathematical Statistics I	42
College Physics Experiments II	45
College Physics I	48
complex variable function	53
Fundamentals of College Computer	56
Basic Computer Programming (C Language)	59
C++ Programming	62
Circuit Theory	66
Analog Electronic Technology	70
Digital Electronic Technology	74
Signal Analysis and Processing	77
Introduction To Electrical Engineering	81
Theory of Electrical Machine	84
Principles and Applications of Microcontrollers	92
Power Electronics	96
Power System Analysis	100
Power System Protective Relaying	103
Electrical Engineering of Power Plants	107

09 Module Descriptions

High Voltage Technique	111
Power Technology Economics and Management	115
Electricity Market	118
Principle and Application of PLC	121
Automation of Electric Power Systems	124
Special Topics in New Technologies of Electrical Engineering	127
Smart Grid Communication Technology	129
Smart Microgrid Technology	131
Professional Cognition Practice	135
Circuit Training	137
Electronic Technology Practice	139
Microcontroller Application Technology Practice	142
Course Project on Power System Analysis	145
Course Design of Power Electronics	148
Course Design of Power Electronics	148
Design of Power System Relay Protection Course	151
Practice of PLC Control System	154
Course Design for Electrical Engineering of Power Plants	157
Practical English for Electrical Engineering	160
Comprehensive Training of Power System Relay Protection	163
Power System Comprehensive Test	166
Comprehensive Experiments in High Voltage Engineering	171
Electrical Production Practice	174
MATLAB Applications in Electrical Engineering	177
Graduation Project	179
Power System Simulation Practice	182
Training of Electric Power Industry Safety Code	185
Practice in Scientific and Technological Writing and Literature Retrieval	187
New Energy Generation and Comprehensive Utilization of Energy	190

Psychological Health Education for College Students

Module designation	psychological health education for College Students
Semester(s) in which the module is taught	1th semester
Person responsible for the module	Mr.Zhang Jinming
Language	Chinese
Relation to curriculum	《Mental Health Education for College Students》 is a public compulsory course for all students in the school,which integrates knowledge transfer,psychological experience and behavior training.The course aims to enable students to clarify the standards and significance of mental health,enhance their awareness of self-mental health care,master and apply mental health knowledge,cultivate self-cognitive ability,interpersonal communication ability,self-regulation ability,effectively improve psychological quality,and promote students' all-round development.
Teaching methods	1.Lecture method; 2.Case Method; 3.Discussion method; 4.Blended teaching method; 5.Psychological training.
Workload (incl.contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32hours Self-study hours = 28 hours
Credit points (ECTS)	ECTS Credit=2.0
Required and recommended prerequisites for joining the module	Nil.
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: Through the teaching of this course,students can understand the relevant theories and basic concepts of psychology,clarify the standards and significance of mental health,understand the psychological development characteristics and abnormal performance of college students,and master the basic knowledge of self-adjustment. ● Skill: Through the teaching of this course,students can master self-exploration skills,psychological adjustment skills and psychological development skills.Such as learning development skills,environmental adaptation skills,stress management skills,communication skills,problem solving skills,self-management skills,interpersonal skills and so

	<p>on.</p> <ul style="list-style-type: none"> ● Competence: <p>Through the teaching of this course, students can establish the independent consciousness of mental health development, understand their own psychological characteristics and personality characteristics, objectively evaluate their physical conditions, psychological conditions and behavioral abilities, correctly understand themselves and accept themselves. When they encounter psychological problems, they can adjust themselves or seek help, and actively explore suitable for themselves and adapt to the living conditions of society.</p>
Content	<p>Part A. Theoretical teaching (32 contact hours; 28 self-study hours)</p> <p>Chapter 1 Overview of mental health (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● An overview of mental health ● College students' mental health status and the existence of psychological barriers ● Factors Affecting College Students' Mental Health <p>Chapter 2 Psychological Adaptation and Counseling of College Students (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of College Students' Psychological Adaptation ● The main problems of college students' psychological adaptation ● The causes of college students' psychological adaptation problems ● Psychological Adaptation Counseling for College Students <p>Chapter 3 College Students' Cognitive Psychology and Counseling (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Cognitive overview ● The Characteristics of College Students' Cognitive Psychology ● The Main Bad Cognition of College Students ● College Students' Cognitive Psychological Counseling <p>Chapter 4 College Students' Emotional Psychology and Counseling (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Emotional overview ● The Characteristics of College Students' Emotional Psychology ● The Main Bad Mood of College Students ● College Students' Emotional Psychological Counseling <p>Chapter 5 College Students' Personality Psychology and Counseling (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Psychological Interpretation of Personality ● Ability, temperament, character ● College Students' Bad Personality and Its Adjustment ● College Students' Personality Psychological Counseling ● Typical character personality psychological analysis classroom sharing report <p>Chapter 6 College Students' Learning Psychology and Counseling (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of learning

	<ul style="list-style-type: none"> ●Characteristics of College Students' Learning ●The psychological problems of college students in learning. ●College Students' Learning Psychological Counseling <p>Chapter 7 College Students' Interpersonal Psychology and Counseling (4 contact hours;8 self-study hours)</p> <ul style="list-style-type: none"> ●An overview of interpersonal communication ●Characteristics of College Students' Interpersonal Communication ●Factors Affecting College Students' Interpersonal Communication ●College Students Interpersonal Psychological Counseling <p>Chapter 8 College Students' Love Psychology and Counseling (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●Overview of love: the Characteristics of College Students' Love Psychology ●Analysis of College Students' Love Psychological Phenomenon ●College Students' Love Psychological Counseling <p>Chapter 9 College students' life education and psychological crisis response (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●Cognition of human life ●The Manifestation of College Students' Psychological Crisis ●The prevention and intervention of college students' psychological crisis <p>Part B.Exercise teaching(3 self-study hours)</p>
Examination forms	Open a written test.
Study and examination Requirements	<p>●Students should complete their homework independently.Late arrivals,early departures or unauthorized absences are not permitted. The assessment methods of this course include two parts: the usual assessment and the final assessment.Among them:</p> <ul style="list-style-type: none"> ●The usual performance accounts for 60 %,which is composed of five parts: classroom psychological sitcom,psychological operation training,interpersonal relationship group training,usual homework and mid-term examination. ●The final examination results accounted for 40 %,and the final examination method was open-book examination.
Reading list	<p>[1]Zhang Jinming,Pu Wenhui,College Students' Mental Health Education Tutorial,Beijing University of Posts and Telecommunications Press,2015.4.</p> <p>[2]Written by Wu Yiling,Mental Health Education Course,Beijing Normal University Press,July 2010.</p> <p>[3]Lei Wuming,Psychology of College Students' Mental Health,Renmin University of China Press,June 2010.</p>
Data of last mendment	June 29,2025

Ideological and Moral Education and the Rule of Law

Module designation	Ideological Morality and the Rule of Law
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Qi Bei
Language	Chinese
Relation to curriculum	<p>This course is a university-wide ideological and political theory course, a compulsory course for all majors, and a required course for freshman of all disciplines across the university. College students are required to recognize that only by striving to master the basic theories of Marxism, cultivating good ideological and moral qualities and legal literacy, integrating their personal life ideals into the cause of the country and the nation, establishing the resolve and confidence to strive for the Chinese Dream of the great rejuvenation of the Chinese nation, and courageously being forerunners ahead of the times can they ultimately achieve great accomplishments. Addressing the ideological, moral and legal issues encountered by college students in their growth process, the course effectively carries out education on the Marxist world outlook, outlook on life, values, moral values and legal outlook. It comprehensively applies knowledge from relevant disciplines and, in accordance with the basic laws of college students' growth, educates and guides them to strengthen their own ideological and moral cultivation, and enhance their legal concepts and awareness.</p>
Teaching methods	<ol style="list-style-type: none"> 1. Lecture method; 2. Case method; 3. Discussion method; 4. Practical teaching.
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours</p>
Credit points	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	Outline of Modern and Contemporary Chinese History、 Basic Principles of Marxism
Module objectives/ intended learning outcomes	<p>Course Objective 1</p> <p>Rationally apply knowledge from relevant disciplines, educate and guide college students to strengthen their ideological and moral cultivation, enhance their legal concepts and awareness, and establish core socialist values in accordance with</p>

	<p>the basic laws of college students' growth.Help students foster correct ideals,beliefs,world outlook and outlook on life,and improve their humanistic quality.</p> <p>Course Objective 2</p> <p>Achieve the unity of knowledge and practice.Integrate theory with practice,analyze and solve practical problems with the theories learned,and guide daily life and practice.</p>
Content	<p>Part A.Theoretical teaching (36 contact hours; 34 self-study hours)</p> <p>Chapter 1 Introduction (6 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● We are in a new era of socialism with Chinese characteristics ● The new era calls for new-era talents who undertake the great mission of national rejuvenation ● Continuously improve ideological and moral standards as well as legal literacy <p>Chapter 2 Understand Life Essence,Hold Life Direction (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Outlook on life is the general view of life ● A correct outlook on life ● Create a meaningful life <p>Chapter 3 Pursue lofty ideals and uphold noble beliefs (6 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● The connotation and significance of ideals and beliefs ● Strengthen faith,conviction and confidence ● Let youth dreams soar in the practice of realizing the Chinese Dream <p>Chapter 4 Carry forward the fine traditions and promote the Chinese spirit (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● The Chinese spirit is the soul of rejuvenating and strengthening the nation. ● Be a loyal patriot in the new era ● Let reform and innovation become the driving force for youth to voyage far <p>Chapter 5 Clarify value requirements and practice value standards (4 contact hour; 4 self-study hours)</p> <ul style="list-style-type: none"> ● The common value pursuit of all the people ● The distinctive features of the Core Socialist Values ● Actively practice the Core Socialist Values <p>Chapter 6 Abide by moral norms and cultivate moral character (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● The core and principles of socialist morality ● Absorb and draw on excellent moral achievements ● Devote oneself to moral practices that uphold virtue and

	<p>pursue goodness</p> <p>Chapter 7 Learn the Thought on the Rule of Law and Improve Legal Literacy (8 contact hours;10 self-study hours)</p> <ul style="list-style-type: none"> ● The features and operation of socialist law ● Uphold law-based governance in all respects ● Safeguard the authority of the Constitution ● Consciously respect,study,abide by and apply the law <p>Part B.Practical teaching (8 self-study hours; 4 self-study hours) Part C.Exam (4 contact hours; 4 self-study hours)</p>
Examination forms	Open-book written examination
Study and examination Requirements	<p>The assessment methods of this course consist of two parts: daily assessment and final assessment.Among them:</p> <ul style="list-style-type: none"> ● The daily grade accounts for 30%,including the midterm examination (20%),assignments (10%) and practical teaching (30%). ● The final grade accounts for 70%.
Reading list	<p>[1] The Writing Group for Key Textbooks of the Project of Research and Construction of Marxist Theory.Ideals,Morality and the Rule of Law.Beijing: Higher Education Press,August 2021 (Revised Edition 2021).</p> <p>[2] Liu Shulin.Teacher’s Reference Book for Ideals,Morality and the Rule of Law (Supplementary Book for Key Textbooks of the Project of Research and Construction of Marxist Theory).Beijing: Higher Education Press (Revised Edition).</p> <p>[3] Department of Social Sciences,Ministry of Education.Teaching Cases for the Course of Ideals,Morality and the Rule of Law.Beijing: Higher Education Press,1st Edition,July 2010.</p>
Data of last mendment	June 29,2025

Conspectus of Chinese Modern History

Module designation	Conspectus of Chinese Modern History
Semester(s) in which the module is taught	First second semester
Person responsible for the module	college of marxism
Language	Chinese
Relation to curriculum	<p>The Outline of Modern Chinese History is a compulsory public ideological and political theory course for college students in China. Through teaching, students can have a basic understanding of modern Chinese history at a macro level, guide students to understand and grasp the historical process and internal laws of social development, revolution, construction and reform in modern China, deeply understand how history and people choose Marxism, the Communist Party of China, the socialist road and the reform and opening up, deeply understand why the Communist Party of China can, why Marxism can be carried out, why socialism with Chinese characteristics is good, and more firmly strive for the great rejuvenation of the Chinese nation under the strong leadership of the Communist Party of China.</p>
Teaching methods	<ol style="list-style-type: none"> 1. Lecture method; 2. Case Method; 3. Discussion method; 4. Blended teaching methods 5. Mixed teaching method;
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours</p>
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Understand the Western powers and China's feudal forces to the Chinese people and the Chinese nation brought about by the deep suffering, understand the Chinese people in modern times to fight for national independence, people's liberation and the realization of national prosperity, people's happiness of the two major historical tasks to continue the struggle of history. 2. To understand the great process and significance of creating and

	<p>developing socialism with Chinese characteristics, and to understand the great achievements and greater significance of socialism with Chinese characteristics in the new era;</p> <p>3. Understand the historical process of Marxism in China, deeply understand the great significance of comprehensively implementing the socialist ideology with Chinese characteristics in the new era;</p> <p>● Skill:</p> <p>1. Understand the historical inevitability of the new democratic revolution replacing the old democratic revolution and the people's Republic replacing the bourgeois republic, understand the historical inevitability of the Communist Party of China leading the Chinese people to embark on the socialist road, and deeply understand that there is no new China without the Communist Party of China, and only socialism can save China.</p> <p>2. We should strengthen the belief that only socialism with Chinese characteristics can develop China, and only upholding and developing socialism with Chinese characteristics can realize the great rejuvenation of the Chinese nation, and enhance the road confidence, theoretical confidence, institutional confidence and cultural confidence of socialism with Chinese characteristics;</p> <p>3. Consciously arming the mind with the innovative theory of the Communist Party of China; it can firmly establish historical materialism and improve the ability to analyze and solve problems by using scientific historical methodology.</p> <p>● Competence:</p> <p>1. Be able to establish a correct outlook on life and world outlook, with good knowledge of humanities and moral cultivation; Understand the national conditions, understand the socialist core values, and have a sense of social responsibility.</p>
Content	<p>Part A. Theoretical teaching (48 contact hours; 42 self-study hours)</p> <p>Chapter 1 The hardships and struggles of the Chinese nation after entering modern times</p> <p>(4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Understand the development of world capitalism and colonial expansion and the decline of Chinese feudal society; ● The semi-colonial and semi-feudal nature of modern Chinese society, the main contradictions and historical tasks; ● To understand the Western powers of China's military aggression, economic plunder, political control and cultural slavery; ● Understand the struggle of the Chinese people for national independence. ● To grasp the reasons for the failure of the Chinese people's struggle against aggression and the awakening of national consciousness. <p>Chapter 2 The early exploration of different social forces on the way out of the country</p> <p>(4 contact hours; 4 self-study hours)</p>

	<ul style="list-style-type: none"> ●The ups and downs of the Taiping Heavenly Kingdom movement; ●The rise and fall of the Westernization Movement; ●The rise and fall of the Reform Movement. <p>Chapter 3 Xinhai Revolution and the end of autocratic monarchy system (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●To understand the process of the Xinhai Revolution; understanding the great significance and failure lessons of the Xinhai Revolution; ●Grasp the historical inevitability of the old democratic revolution giving way to the new democratic revolution. <p>Chapter 4 The founding of the Communist Party of China and the new situation of Chinese revolution (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●To understand the inevitability of the New Culture Movement and the May Fourth Movement and their historical role and significance in modern Chinese history, and to understand the profound relationship between the May Fourth Movement and the Communist Party of China and the Chinese revolutionary movement; ●Understand the various social trends of thought during the May Fourth Movement and the influence of the spread of Marxism on the Chinese revolution; ●Understand the original intention and mission of the Communist Party of China and the historical inevitability and significance of the founding of the Communist Party of China; ●To grasp the rise of the first Kuomintang-Communist cooperation and the national revolution and the reasons for its failure. <p>Chapter 5 new path of chinese revolution (4 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●Understand the arduous process of the Chinese Communists exploring the new road of the Chinese revolution; ●The theory of understanding the new path of the Chinese revolution; ●To understand the historical significance of the armed struggle and agrarian revolution carried out by the Communist Party of China; ●It is extremely important to master the combination of the basic principles of Marxism and the concrete practice of the Chinese revolution. <p>Chapter 6 The Anti-Japanese War of the Chinese nation (4 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●To understand the ambition of Japanese militarism to invade China and its crimes; ●To understand the situation of the Anti-Japanese War in the front battlefield of the Kuomintang; ●Understanding that the Communist Party of China is the mainstay of the Anti-Japanese War; ●Grasp the reasons and great significance of the victory of the Anti-Japanese War. <p>Chapter 7 Struggle for the establishment of new China</p>
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	<p>(2 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●Understand the struggle of the Communist Party of China for peace and democracy; ●Understand the Kuomintang reactionaries in the military,political, economic failure and the reasons; ●Understand the process of the liberation war led by the Communist Party of China and the historical significance of its great victory; ●Grasp the significance and basic experience of the victory of the Chinese revolution. <p>Chapter 8 The founding of the People's Republic of China and the exploration of China's socialist construction road</p> <p>(4 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●Understand the situation and tasks in the early days of the founding of New China; ●Understand the background of the preliminary exploration of the socialist road; ●Understand the party's general line and socialist transformation in the transitional period; ●It is the choice of history and people to master the transformation of our country from new democracy to socialism and take the socialist road. ●Grasp the experience and lessons of the first generation of leaders of the Communist Party of China in exploring the road of socialist construction. <p>Chapter 9 Reform and opening up and the creation and development of socialism with Chinese characteristics</p> <p>(4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Understand the historical process of reform and opening up and socialist modernization; ●Understand the basic theory,basic line,basic program and basic experience of the Communist Party of China in the primary stage of socialism; ●Master the historical process and theoretical achievements of Marxism in China in the new period. <p>Chapter 10 socialism with chinese characteristics entering a new era</p> <p>(6 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●Understand the historical achievements and historical changes of the party and the state since the 18 th National Congress; ●Understand the goal of building a well-off society in an all-round way,the Chinese dream of national rejuvenation,the overall layout of the " five in one " and the " four comprehensive " strategic layout; ●Grasp the main content and historical status of the thought of socialism with Chinese characteristics in the new era of president xi jinping; ●To understand the overall victory of poverty alleviation and the
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09 Module Descriptions

	<p>realization of the goal of building a well-off society in an all-round way;</p> <ul style="list-style-type: none"> ●Understand the new development stage,new development concept and new development pattern. <p>Part B.Exercise teaching(4 contact hours; 4 self-study hours)</p> <p>Part C.Experiment teaching(4 contact hours; 4 self-study hours)</p>
Examination forms	Open-book written examination
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete their homework and practice independently.Late arrivals,early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include two parts: usual assessment and final assessment.Among them:</p> <ul style="list-style-type: none"> ●The usual results accounted for 30 %,including 20 % of performance,20 % of homework,30 % of practice,and 30 % of mid-term examination. ●The final grade accounted for 70 %.
Reading list	<ol style="list-style-type: none"> 1.Compilation Group of this book,Outline of Modern and Contemporary Chinese History (Revised Edition 2021).Beijing: Higher Education Press,2021.8. 2.This book writing group,a brief history of the Communist Party of China.Beijing: People's Publishing House,2021.2 3.The CPC Central Committee Party History Research Office,the Communist Party of China for 90 years.Beijing: History of the Communist Party of China Press,2016.6 4.Institute of Contemporary China,70 years of new China.Beijing: Contemporary China Press,2019.12 5.Zhang Qizhi's work,volume of late Qing Dynasty and the Republic of China in Chinese history.Beijing: Higher Education Press,2001.7
Data of last mendment	June 29,2025

Basic Principles of Marxism

Module designation	Basic Principles of Marxism
Semester(s) in which the module is taught	3th semester
Person responsible for the module	Mr.Jian He
Language	Chinese
Relation to curriculum	This course is the ideological and political theory course of the whole school,and it is a compulsory course for all majors.The main purpose of setting up this course is to educate students on the basic principles of Marxism,help students master the world outlook and methodology of Marxism,establish a scientific outlook on life and values,learn to observe and analyze problems with the world outlook and methodology of Marxism,and establish the ideals and beliefs of socialism with Chinese characteristics for students.Consciously adhere to the party's basic theory,basic line and basic program to lay a solid theoretical foundation.
Teaching methods	<ol style="list-style-type: none"> 1. Lecture method; 2. Case Method; 3. Discussion method; 4. Practice teaching
Workload (incl.contact hours, self-study hours)	Total workload = 90 hours Contact hours = 40 hours Self-study hours = 42 hours
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	Morality and Legal System,Outline of Modern Chinese History
Module objectives/ intended learning outcomes	<p>Objectives 1 Help students master the basic viewpoints of dialectical materialism and historical materialism,establish a correct world outlook,outlook on life and values,and learn to use Marxist positions,viewpoints and methods to analyze and solve practical problems.</p> <p>Objectives 2 To establish the ideals and beliefs of socialism with Chinese characteristics for students,consciously adhere to the party's basic theory,basic line and basic program,comprehensively improve their own quality,and become qualified builders and successors of the cause of socialism with Chinese characteristics.</p>
Content	<p>Part A.Theoretical teaching (36 contact hours)</p> <p>Chapter 1 Introduction (4 contact hours, 4 self-study hours)</p> <ul style="list-style-type: none"> ●What is Marxism;

	<ul style="list-style-type: none"> ●the establishment and development of Marxism; ●The distinctive features of Marxism; ●The contemporary value of Marxism; ●consciously learning and applying Marxism; <p>Chapter 2 The materiality and development law of the world (8 contact hour, 8 self-study hours)</p> <ul style="list-style-type: none"> ●World diversity and material unity; ●The universal connection and change development of things; ●Materialist dialectics is the fundamental method to understand and transform the world. <p>Chapter 3 Practice and Cognition and Its Development Law (6 contact hours, 4 self-study hours)</p> <ul style="list-style-type: none"> ●Practice and cognition; ●Truth and value; ●Understanding the world and transforming the world; <p>Chapter 4 Human society and its law of development (6 contact hours, 4 self-study hours)</p> <ul style="list-style-type: none"> ●the existence and development of human society; ●The driving force of social and historical development; ●The role of the people in the development of history; <p>Chapter 5 The essence and law of capitalism (4 contact hour, 4 self-study hours)</p> <ul style="list-style-type: none"> ●Commodity economy and law of value; ●Capitalist economic system; ●Capitalist superstructure; <p>Chapter 6 The development and trend of capitalism (4 contact hours, 4 self-study hours)</p> <ul style="list-style-type: none"> ●The formation and development of monopoly capitalism; ●Correctly understand the new changes of contemporary capitalism; ●The historical status and development trend of capitalism; <p>Chapter 7 The development of socialism and its law (2 contact hours, 2 self-study hours)</p> <ul style="list-style-type: none"> ●The historical process of five hundred years of socialism; ●The basic principles of scientific socialism; ●Explore the law of development of socialism in practice; <p>Chapter 8 The lofty project of communism and its final realization (2 contact hours, 2 self-study hours)</p> <ul style="list-style-type: none"> ●Looking forward to the future of a new communist society; ●To realize the inevitable trend of communist historical development; ●The lofty ideal of communism and the common ideal of socialism with Chinese characteristics; <p>Part B. Practical teaching (2 self-study hours)</p> <p>Part C. Exam (4 contact hours)</p>
Examination forms	Open-book written test.

09 Module Descriptions

<p>Study and examination Requirements</p>	<p>The assessment methods of this course include two parts: the usual assessment and the final assessment. Among them:</p> <ul style="list-style-type: none"> ●The usual grades accounted for 50 %,including mid-term exams (40 %),homework (20 %) and practical teaching (40 %). ●Final results accounted for 50 %.
<p>Reading list</p>	<p>[1] This book writing group.'Basic Principles of Marxism' (2021 Edition) [M].Beijing: Higher Education Press,2021.</p> <p>[2] This book writing group.Introduction to the Basic Principles of Marxism Guidance Book (2020 Edition) [M].Beijing: Higher Education Press,2020.</p>
<p>Data of last mendment</p>	<p>June 29,2025</p>

An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with

Chinese Characteristics

Module designation	An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics
Semester(s) in which the module is taught	Fourth semester
Person responsible for the module	wangqing
Language	Chinese
Relation to curriculum	'An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics' is a compulsory ideological and political theory course for undergraduate and junior college students in China. Through the study of this course, students can systematically master the formation and development, main content and spiritual essence of the modernization of Marxism in China, and constantly enhance their road self-confidence, theoretical self-confidence, institutional self-confidence and cultural self-confidence, and strengthen the ideals and beliefs of socialism with Chinese characteristics. This course focuses on the explanation of the party's basic theory, basic line and basic strategy, and enhances students' understanding and recognition of the party's line, principles and policies.
Teaching methods	1. Lecture method; 2. Case Method; 3. Discussion method; 4. Mixed teaching method.
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	Ideological Morality and Rule of Law, Outline of Modern Chinese History, Introduction to the Basic Principles of Marxism
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: It enables students to more accurately grasp the theoretical results formed in the process of sinicization and modernization of Marxism. ● Skill: It makes students more deeply understand the historical process, historical changes and historical achievements of the revolution, construction and reform led by the Communist Party of China, and more thoroughly understand the basic theory, basic line and basic

	<p>strategy of the Communist Party of China in the new era.</p> <ul style="list-style-type: none"> ● Competence: To cultivate students' habit of theoretical thinking, help students more effectively improve the ability to use Marxist standpoints, viewpoints and methods to understand problems, analyze problems and solve problems.
Content	<p>Part A. Theoretical teaching (48 contact hours, 42 self-study hours)</p> <p>Chapter 1 Introduction (6 contact hours; 4 self-study hours) The historical process and theoretical achievements of the sinicization and modernization of Marxism in China</p> <p>Chapter 2 Mao Tse-tung thought (22 contact hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ● Mao Zedong Thought and Its Historical Position ● new democratic revolution theory ● socialism transforming theory ● The theoretical results of the preliminary exploration of the road of socialist construction <p>Chapter 3 theoretical system of socialism with Chinese characteristics (20 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● The formation and development of the theoretical system of socialism with Chinese characteristics ● Deng Xiaoping theory ● The important thought of "three represents" ● scientific developing sight <p>Part B. Exercise teaching (8 self-study hours) It consists of making PPT, mind map, campus practice, reading (watching) after feeling and other links. The specific implementation is arranged by the teachers according to the actual situation.</p>
Examination forms	Open-book written test.
Study and examination Requirements	<ul style="list-style-type: none"> ● Students should complete homework and extracurricular practice report independently. Late arrivals, early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include two parts: the usual assessment and the final assessment. Among them:</p> <ul style="list-style-type: none"> ● The usual performance accounted for 50%, including homework (20%), mid-term test (40%) and extracurricular practice (40%). Among them, the comprehensive evaluation includes: attendance, homework, classroom discussion, in-class test and paper performance assessed by the learning platform. ● Final results accounted for 50%.

Reading list	<p>[1] This book writing group. An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics (2023 Edition). Beijing: Higher Education Press, 2023</p> <p>[2] Selected Works of Mao Zedong (Volume 1-4). Beijing: People's Publishing House, 1991</p> <p>[3] Selected Works of Deng Xiaoping (Volume 1-3). Beijing: People's Publishing House, 1994</p> <p>[4] Selected Works of Jiang Zemin (Volume 1-3). Beijing: People's Publishing House, 2006</p> <p>[5] Selected Works of Hu Jintao (Volume 1-3). Beijing: People's Publishing House, 2016</p> <p>[6] Document drafting group. " Resolution of the Central Committee of the Communist Party of China on the major achievements and historical experience of the Party's centennial struggle " tutorial. Beijing: People's Publishing House, 2021</p> <p>[7] National Development and Reform Commission. " Outline of the 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and Vision 2035 " tutorial. Beijing: People's Publishing House, 2021</p> <p>[8] Propaganda Department of the CPC Central Committee. Beijing: People's Publishing House, 2023</p> <p>[9] Tutored reading of the party's 20th congress report. Beijing: People's Publishing House, 2022</p>
Data of last mendment	June 29, 2025

An Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era

Module designation	An Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era
Semester(s) in which the module is taught	Fifth semester
Person responsible for the module	wangqing
Language	Chinese
Relation to curriculum	So that students can have a more accurate understanding of the party's major theoretical innovation in the process of building socialism with Chinese characteristics in the new era. Continuously enhance students' understanding and recognition of the party's line, principles and policies, strengthen road self-confidence, theoretical self-confidence, institutional self-confidence, cultural self-confidence, strengthen the ideals and beliefs of socialism with Chinese characteristics, consciously devote themselves to the great practice of socialism with Chinese characteristics, and make due contributions to the great rejuvenation of the Chinese nation.
Teaching methods	1. Lecture method; 2. Case Method; 3. Discussion method; 4. Mixed teaching method
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	Ideology and Morality and Rule of Law, Outline of Modern Chinese History, Introduction to the Basic Principles of Marxism, Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: It enables students to systematically master the main content and scientific system of the thought of socialism with Chinese characteristics in the new era of president xi jingping. ● Skill: So that students can have a more accurate understanding of the party's major theoretical innovation in the process of building socialism with Chinese characteristics in the new era. ● Competence: Cultivate the world outlook, methodology and standpoints and methods that run through this idea, and help students more effectively improve the ability to use Marxist standpoints, viewpoints and methods

	to understand problems,analyze problems and solve problems.
Content	<p>Part A.Theoretical teaching(40 contact hours)</p> <p>Chapter 1 Introduction (2 contact hours; 0 self-study hours) A new leap in the era of Marxism in China</p> <p>Chapter 2 Adhering to and developing socialism with Chinese characteristics in the new era (2contact hours; 2 self-study hours)</p> <p>Chapter 3 Adhering to the overall leadership of the party (2 contact hours; 2 self-study hours)</p> <p>Chapter 4 keeping in mind the people-centered concept (2 contact hours; 0 self-study hours)</p> <p>Chapter5 comprehensively deepening reform and opening up (2 contact hours; 0 self-study hours)</p> <p>Chapter6 Promote high-quality development (2 contact hours; 2 self-study hours)</p> <p>Chapter7 The education,science and technology,talent strategy of socialist modernization construction (2 contact hours; 0 self-study hours)</p> <p>Chapter 8 Develop the whole process of people's democracy (2 contact hours; 2 self-study hours)</p> <p>Chapter 9 comprehensively implement the rule of law (2 contact hours; 2 self-study hours)</p> <p>Chapter 10 construction of socialist culture power (2 contact hours; 0 self-study hours)</p> <p>Chapter 11 Strengthen social construction with the focus on ensuring and improving people's livelihood. (2 contact hours; 2 self-study hours)</p> <p>Chapter 12 constructing of socialism ecological civilization (2 contact hours; 0 self-study hours)</p> <p>Chapter 13 Maintain and shape national security (2 contact hours; 0 self-study hours)</p> <p>Chapter 14 Build and consolidate national defense and a strong people's army (2 contact hours; 2 self-study hours)</p> <p>Chapter 15 Adhering to 'one country,two systems' and promoting the reunification of the motherland (2 contact hours; 2 self-study hours)</p> <p>Chapter 16 Major-country diplomacy with Chinese characteristics and the promotion of building a community of shared future for mankind (2 contact hours; 2 self-study hours)</p> <p>Chapter 17 comprehensively strengthen party discipline (2 contact hours; 2 self-study hours)</p> <p>Part B.Exercise teaching(8 self-study hours) It consists of making PPT,mind map,campus practice,reading (watching) after feeling and other links.The specific implementation is</p>

	arranged by the teachers according to the actual situation.
Examination forms	Open-book written examination
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete homework and extracurricular practice report independently.Late arrivals,early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include two parts: the usual assessment and the final assessment.Among them:</p> <ul style="list-style-type: none"> ●The usual performance accounted for 50 %,including homework (20 %),mid-term test (40 %) and extracurricular practice (40 %).Among them,the comprehensive evaluation includes: attendance,homework,classroom discussion,in-class test and paper performance assessed by the learning platform. ●Final results accounted for 50 %.
Reading list	<p>[1]Xi Jinping on Governing the Country (Volume I).Beijing: People's Publishing House,2018</p> <p>[2]Xi Jinping on Governing the Country (Vol.2).Beijing: People's Publishing House,2017</p> <p>[3] Xi Jinping On Governing the Country (Volume III).Beijing: People's Publishing House,2020</p> <p>[4] Xi Jinping On Governing the Country (Vol.4).Beijing: People's Publishing House,2022</p> <p>[5] Selected Readings of Xi Jinping (Vol.1).Beijing: People's Publishing House,2023</p> <p>[6] Selected Readings of Xi Jinping (Vol.2).Beijing: People's Publishing House,2023</p> <p>[7] Propaganda Department of the CPC Central Committee.Beijing: People's Publishing House,2023</p> <p>[8] Tutored reading of the party's 20th congress report.Beijing: People's Publishing House,2022</p> <p>[9] Document drafting group.The ' Resolution of the Central Committee of the Communist Party of China on the Major Achievements of the Party's Hundred Years of Struggle and Historical Experience' tutorial.Beijing: People's Publishing House,2021</p> <p>[10] National Development and Reform Commission." Outline of the 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and Vision 2035 " tutorial.Beijing: People's Publishing House,2021</p>
Data of last mendment	June 29,2025

Situation and Policy

Module designation	Situation and Policy
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Ms.Gao Xiao Fei
Language	Chinese
Relation to curriculum	<p>The course of " Situation and Policy " is a compulsory course in the series of ideological and political theory courses in colleges and universities based on the training objectives of colleges and universities.It shoulders an important mission in the ideological and political education of college students.</p> <p>This course mainly takes the current major problems at home and abroad as an opportunity to educate college students on the situation and policy,help college students understand the international and domestic situation,and understand the major strategic principles and policies of the party and the country.</p> <p>This course focuses on the education of college students on the situation,tasks and achievements of socialist construction with Chinese characteristics in the new era; the education of major strategic policies,major activities and major reform measures of the party and the state.</p> <p>Through the timely and scientific education of students on the basic knowledge of domestic situation policies,world political economy and international relations,we can help students broaden their horizons,understand and correctly treat major current events at home and abroad in a timely manner,stimulate college students' patriotism,enhance national self-esteem and social responsibility,and improve political sensitivity and policy discrimination.Guide young college students to establish a correct view of history,nationality,country and culture,and cultivate a new generation of qualified builders and reliable successors of socialism with Chinese characteristics.</p>
Teaching methods	<ol style="list-style-type: none"> 1.Lecture method; 2.Case Method; 3.Discussion method; 4.Mixed teaching method;
Workload (incl.contact hours, self-study hours)	<p>Total workload =8 hours</p> <p>Contact hours = 8 hours</p>
Credit points (ECTS)	ECTS Credit=2.0
Required and recommended prerequisites for joining the module	The basic principles of Marxism,the outline of modern history,the introduction of Mao Zedong Thought and the theoretical system of socialism with Chinese characteristics,and the introduction of Xi Jinping new era of socialism with Chinese characteristics.

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Take the current major hot issues at home and abroad as an opportunity to educate college students on the situation,tasks and achievements of socialist construction with Chinese characteristics in the new era. 2.It enables students to understand the major strategic principles and policies,major activities and major reform measures of the party and the state,and grasp the development of social reform and development. ● Competence: <ol style="list-style-type: none"> 1.To cultivate students' keen insight and policy discrimination in observing social situation problems; 2.Cultivate students' ability to analyze,deal with and deal with complex social problems,and improve students' comprehensive quality.
<p>Content</p>	<p>Part A.Theoretical teaching(8 contact hours;)</p> <p>Chapter 1 Speed up the construction of socialist cultural power (2 contact hours;)</p> <ul style="list-style-type: none"> ●Strengthen the soul of the country to take on the historical mission; ●Extraordinary achievements highlight the great power of practice; ●Firm confidence opens the chapter of the times; <p>Chapter 2 Supporting Chinese-style modernization with high-quality population development (2 contact hours;)</p> <ul style="list-style-type: none"> ●Population development is facing a new situation; ●A comprehensive dialectical view of population issues; ●Promote high-quality population development; <p>Chapter 3 To explore the correct way of getting along between China and the United States in the new period (2 contact hours;)</p> <ul style="list-style-type: none"> ●Sino-US relations have experienced ups and downs; ●The influence of Trump's re-ruling; ●Solve the necessary questions of Sino-US relations; <p>Chapter 4 China's economy is stable and far-reaching (2 contact hours;)</p> <ul style="list-style-type: none"> ●Where does development confidence come from; ●What to rely on in the face of difficulties; ●How to work hard;
<p>Examination forms</p>	<p>Open the paper,learn online exam.</p>
<p>Study and examination Requirements</p>	<ul style="list-style-type: none"> ●Students should complete homework independently.Late arrivals,early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include two parts: usual assessment and final assessment.</p> <p>Among them:</p> <ul style="list-style-type: none"> ●The usual performance accounts for 50 %,which is composed of

09 Module Descriptions

	<p>homework evaluation (50 %).</p> <ul style="list-style-type: none"> ●The final grade accounts for 50 %,which is composed of learning online examination.
Reading list	<p>[1]'People's Daily',' Reference News',' Global Times' and other important newspapers.</p> <p>[2]'Half Monthly Talks','Outlook',' World Knowledge' and other related magazines.</p> <p>[3]'current affairs report' audio-visual version and other related audio-visual materials.</p> <p>[4] Important documents of the Central Committee of the Communist Party of China and the spirit of the central leaders' important speech.</p> <p>[5] The Ministry of Education and other relevant departments from time to time issued the situation education graphics,audio and video materials.</p>
Data of last mendment	June 29,2025

Advanced Mathematics

Module designation	Advanced Mathematics
Semester(s) in which the module is taught	1th and 2th semester
Person responsible for the module	Ding Dali
Language	Chinese
Relation to curriculum	'Higher Mathematics' is an important basic subject in science and engineering colleges, and it is also a compulsory mathematics course for students majoring in science and engineering. As a basic science, higher mathematics has its inherent characteristics, which are high abstraction, strict logic and wide application. Abstractness and computability are the most basic and significant characteristics of mathematics. With a high degree of abstraction and unity, we can reveal its essential laws in depth and make it more widely used. Rigorous logic means that in the induction and collation of mathematical theory, whether it is concepts and expressions, or judgment and reasoning, we must use the rules of logic and follow the laws of thinking. Therefore, mathematics is also a way of thinking. The process of learning mathematics is the process of thinking training.
Teaching methods	1. Lecture method; 2. Discussion method; 3. Mixed teaching method; 4. Case Method
Workload (incl. contact hours, self-study hours)	Total workload = 300 hours Contact hours = 160 hours Self-study hours = 140 hours
Credit points (ECTS)	ECTS Credit=10.0
Required and recommended prerequisites for joining the module	
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: Some properties and conclusions of limit and continuity of function, calculation and application of differential calculus of univariate function, calculation and application of integral calculus of univariate function, some types and solutions of ordinary differential equations, application of space analytic geometry and vector algebra, calculation and application of differential calculus of multivariate function, calculation and application of integral calculus of multivariate function, calculation and application of infinite series. ● Skill: 1. Through the study of this course, students can master the basic

	<p>knowledge,basic theory and basic methods of higher mathematics,and provide effective mathematical tools for students to solve practical problems.</p> <p>2.It provides essential basic knowledge of mathematics for the follow-up courses,cultivates students' computing ability and logical thinking ability,and can comprehensively use the knowledge learned to analyze problems and solve related problems.</p> <p>● Competence:</p> <p>It has the natural science knowledge and engineering basic knowledge of mathematics,physics,mechanics,electricity and other natural science knowledge and engineering basic knowledge needed by the energy and power engineering specialty,and can be used to describe complex engineering problems in this field.</p>
Content	<p>Part B.Theoretical teaching(80 contact hours; 0 self-study hours)</p> <p>Chapter 1 Function,Limit and Continuity (16 contact hours; 10 self-study hours)</p> <ol style="list-style-type: none"> (1) Variables and functions (2) limit of number sequence (3) limit of function (4) Infinite Mass and Infinite Small Quantity (5) limit algorithm (6) Existence criterion of limit and two important limits (7) comparison of infinitesimal (8) the continuity <p>Chapter 2 One-variable function differential calculus (10 contact hours; 10self-study hours)</p> <ol style="list-style-type: none"> (1) the concept of derivative (2) derivation rule (3) higher derivative (4) differential function <p>Chapter 3 Application of One-variable Function Differential Calculus (10 contact hours; 10 self-study hours)</p> <ol style="list-style-type: none"> (1) differential mean value theorem (2) robida principle (3) Monotonicity and extremum of function (4) The maximum and minimum value of function and its application (5) Concavity and convexity of the curve,inflection point (6) The asymptote of the curve,the description of the function graph (7) Examples of other applications <p>Chapter 4 One-variable function integrals (20 contact hours; 20 self-study hours)</p> <ol style="list-style-type: none"> (1) the concept of definite integrals (2) Primitive function and basic theorem of calculus (3) Indefinite integral and primitive function method (4) The use of integral table (5) the evaluation of definite integral

	<p>(6) improper integral</p> <p>Chapter 5 Application of one-variable function integral (6 contact hours; 10 self-study hours)</p> <p>(1) Differential element method (2) area of the planar figure (3) The volume of geometry (4) The arc length of the curve and the side area of the rotating body (5) The application of definite integral in physics (6) Examples of the application of definite integral in economics</p> <p>Chapter 6 ordinary differential equation (18 contact hours; 10 self-study hours)</p> <p>(1) Basic concepts of ordinary differential equations (2) First-order differential equation and its solution (3) Reduced-order method of differential equations (4) The structure of solutions of linear differential equations (5) Second-order linear differential equations with constant coefficients</p> <p>Chapter 7 Vector algebra and space analytic geometry (12 contact hours; 10 self-study hours)</p> <p>(1) Vector and its linear operation (2) Quantity product, vector product (3) Plane and its equations (4) Space straight line and its equation (5) Surface and its equations (6) Space curve and its equation</p> <p>Chapter 8 Multivariate function differential method and its application (18 contact hours; 16 self-study hours)</p> <p>(1) Basic concepts of multivariate functions (2) Partial derivative (3) Total differential (4) Derivation rule of multivariate composite function (5) Derivation formula of implicit function (6) Geometric application of multivariate function differential calculus (7) Directional derivative and gradient (8) The extreme value of multivariate function and its solution</p> <p>Chapter 9 Multivariate function integral and its application (28 contact hours; 24 self-study hours)</p> <p>(1) The concept and properties of double integral; (2) Calculation method of double integral (3) Triple integral (4) Application of multiple integrals (5) Curve integral for arc length (6) Curve integral of coordinates (7) Green's formula and its application (8) Surface integral for area (9) Surface integral of coordinates (10) Gauss formula, flux and divergence</p>
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	<p>(11) Stokes formula,circulation and curl</p> <p>Chapter 10 infinite series</p> <p>(22 contact hours; 20 self-study hours)</p> <p>(1) The concept and properties of constant series</p> <p>(2) The convergence method of constant series</p> <p>(3) Power series</p> <p>(4) The function is expanded into a power series</p> <p>(5) Application of power series expansion of function</p> <p>(6) Fourier series</p> <p>(7) Fourier series of general periodic function</p>
Examination forms	Closed-book written exam.
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted.The assessment methods of this course include two parts: usual assessment and final assessment.Among them: ●The usual performance accounted for 30 %,including comprehensive evaluation (70 %) and stage assessment (30 %).Among them,the comprehensive evaluation includes: attendance,homework,classroom discussion,and in-class test results assessed by the learning platform. ●The final grade accounted for 70 %.
Reading list	<p>[1].Editor-in-chief,Department of Applied Mathematics,Tongji University.'Higher Mathematics'(7th Edition).Beijing: Higher Education Press,2018</p> <p>[2].Editor-in-chief,Department of Applied Mathematics,Tongji University.'Higher Mathematics'(6th Edition).Beijing: Higher Education Press,2009</p> <p>[3].Editor-in-chief,Department of Applied Mathematics,Tongji University.'Calculus' (Second Edition).Beijing: Higher Education Press,2003</p> <p>[4].Editor-in-chief,Department of Applied Mathematics,Tongji University.'calculus' (first edition).Beijing: Higher Education Press,1999</p> <p>[5].Huang Lihong edited' Advanced Mathematics'.Beijing: Peking University Press,2018</p>
Data of last mendment	June 29,2025

Linear Algebra II

Module designation	Linear algebra II
Semester(s) in which the module is taught	Semester 2
Person responsible for the module	Xing Feng
Language	Chinese
Relation to curriculum	<p>'Linear algebra' is an important basic course of natural science. The problems it studies widely exist in various fields of technical science, and the methods it introduces are widely used in various disciplines. It is a compulsory basic course for students of science and engineering in the whole college.</p> <p>Through the study of this course, students can master the basic knowledge, basic theory and basic methods of 'linear algebra', and lay a good mathematical foundation for students to apply the knowledge of 'linear algebra' in natural science and engineering technology.</p> <p>The main task of this course is to train students to master the basic knowledge of 'linear algebra', to further cultivate students' logical thinking ability, the ability to analyze and solve problems, to expand students' horizons, and to train students to apply the knowledge of 'linear algebra' in natural science and engineering technology. Through the study of this course, students can obtain the methods commonly used in applied science, improve the ability to solve practical problems, so as to lay the necessary mathematical foundation for students to learn follow-up courses and further improve.</p>
Teaching methods	Case Method; Teaching method; Questioning method; Discussion method
Workload (incl. contact hours, self-study hours)	Total workload = 75 hours Contact hours = 40 hours Self-study hours = 35 hours Total workload = 75, of which: contact hours = 40, self-study hours = 35
Credit points (ECTS)	ECTS Credit=2.5
Required and recommended prerequisites for joining the module	higher mathematics
Module objectives/ intended learning	<p>Learning outcomes</p> <ul style="list-style-type: none"> ● Knowledge:

<p>outcomes</p>	<p>1.the concept and properties of determinant; the concept and properties of matrix and matrix rank; elementary transformation of matrix and elementary square matrix; the concept,nature and judgment of linear correlation of vector group; the concept of vector space,the structure of the solution of linear equations; the concept and properties of eigenvalues and eigenvectors of square matrix.</p> <p>2.Determinant calculation; matrix operation and operation rules,matrix rank calculation and application; the application of elementary transformation of matrix; the calculation and application of linear correlation and linear representation of vector groups; the general solution of the equations is solved by using the structure of the solution of the linear equations.Calculate the eigenvalues and eigenvectors of the square matrix.</p> <p>●Skill:</p> <p>Master the basic concepts,basic theories and basic principles of linear algebra,so that students have a certain ability to abstract and summarize problems and logical reasoning ability.To cultivate students' unique engineering mathematical thinking mode and logical reasoning ability,and lay a solid mathematical foundation for further study of follow-up courses and modern science and technology.</p> <p>2.Mastering the mathematical operation skills of linear algebra,using the basic knowledge and basic theory of engineering mathematics to analyze and solve problems,the ability to further cultivate,train and improve,and provide the necessary basis for students to learn subsequent courses and mathematical knowledge.It provides students with applicable mathematical methods and calculation methods for scientific research and practical work.</p> <p>● Competence:</p> <p>1.Get the methods commonly used in applied science,improve the ability to solve practical problems,so as to lay the necessary mathematical foundation for students to learn follow-up courses and further improve.</p> <p>The language tools of mathematics,natural science and engineering science can be used to express the complex engineering problems of electronic information.</p>
<p>Content</p>	<p>Theoretical teaching(40 contact hours; 35 self-study hours)</p> <p>Chapter 1 Determinants (8 contact hours; 7 self-study hours) Second-order and third-order determinants; full arrangement and exchange; the definition of n-order determinant; the properties of determinant; the determinant is expanded by rows (columns).</p> <p>Chapter 2 Matrix and Its Operation (8 contact hours; 7 self-study hours) Linear equations and matrices; matrix operation; inverse matrix; cramer's law; matrix block method.</p> <p>Chapter 3 Elementary transformation of matrix and linear equations (8 contact hours; 7 self-study hours) Elementary transformation of matrix; the rank of matrix; the solution of linear equations.</p> <p>Chapter 4 Linear Correlation of Vector Groups (8 contact hours; 7 self-study hours) Vector group and its linear combination; linear correlation has nothing to do with linearity; the discriminant theorem of linear correlation; the rank of</p>

	<p>the vector group; the structure of the solution of linear equations; vector space.</p> <p>Chapter 5 Similar matrix and quadratic form (8 contact hours; 7 self-study hours)</p> <p>The inner product of vector; eigenvalues and eigenvectors of square matrix.</p>
Examination forms	The closed-book written examination method is adopted
Study and examination Requirements	<p>1.Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted.</p> <p>2.This course is evaluated by the combination of usual scores,experimental scores and final exam scores,and comprehensively evaluates students' learning situation,ability to analyze and solve complex engineering problems.</p> <p>3.The usual performance evaluation standard is 30 %,including homework (60 %) and stage assessment (40 %); the final examination accounted for 70 %.</p> <p>4.All scores were evaluated by the percentage system,and 60 was the passing score of this course.</p>
Reading list	<p>Required books</p> <p>1.Xie Junlai editor.'Linear Algebra' (First Edition).Beijing: Science Press,2015</p> <p>2.Editor-in-chief,Department of Mathematics,Tongji University.'Linear Algebra' (6th Edition).Beijing: Higher Education Press,2014</p> <p>3.Juyu horse.'Linear Algebra' (Second Edition).Beijing: Tsinghua University Press,2020</p>
Data of last mendment	September 23,2025

College English

Module designation	College English 1 College English 2
Semester(s) in which the module is taught	1st semester; 2ndsemester
Person responsible for the module	Hongwu Liu
Language	Chinese
Relation to curriculum	<p>College English is a compulsory foundational course in applied undergraduate education at our institution,embodying both instrumental and humanistic dimensions.In terms of its instrumental nature,firstly,the College English course builds upon and extends English instruction from the basic education stage.Its aim is to further enhance students' abilities in listening,speaking,reading,writing,and translation on the basis of senior high school English teaching.It enables students to master essential English knowledge and practical skills,while strengthening their capacities for autonomous learning,critical thinking,and innovation.This equips them to effectively communicate orally and in writing in English in future work and social interactions,meeting the needs of social development and economic construction for applied undergraduate talents.Secondly,through English for Specific Purposes (ESP) instruction,the College English course allows students to learn academic or professional English related to their fields,thereby acquiring relevant competencies for international communication in academic or professional contexts.Regarding its humanistic nature,firstly,one of the important tasks of the College English course is to provide cross-cultural education.Beyond learning and exchanging advanced scientific knowledge and professional information,students who learn and master English as a communication tool also need to understand foreign societies and cultures,enhance their comprehension of different cultures,raise awareness of similarities and differences between Chinese and foreign cultures,and develop intercultural communicative competence.Secondly,the College English course can cultivate students' ability to understand and interpret Chinese culture,thereby contributing to the global dissemination of Chinese culture.The core of humanistic education is people-oriented,promoting human values and emphasizing the cultivation of comprehensive qualities and holistic development.Integrating course content,socialist core values are organically incorporated into the teaching materials of College English.Therefore,it is essential to explore the rich humanistic connotations of the College English course and achieve an organic unity of its instrumental and humanistic dimensions.</p>

Teaching methods	Target students: Power Engineering major students Type of teaching: Theoretical teaching and experimental teaching Teaching methods: Case method Contact hour: 180 periods Including Theoretical teaching: 180 periods Computer practice: 0 periods Size of class: 40-80 persons
Workload (incl. contact hours, self-study hours)	Total workload = 240 hours Contact hours = 128 hours Self-study hours = 112 hours
Credit points (ECTS)	ECTS Credit = 8.0
Required and recommended prerequisites for joining the module	English of Senior High School, English Listening for Beginners
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>Listening:</p> <ol style="list-style-type: none"> 1. Be able to understand English-medium instruction, familiar short English conversations, and lectures or reports on familiar topics. 2. Be able to comprehend slower-paced English programs, grasp the general idea and main points, and effectively employ listening strategies to aid comprehension. 3. Be able to understand English courses taught in English at a corresponding level; can understand common instructions, product descriptions, or operational manuals related to their job positions. <p>Speaking:</p> <ol style="list-style-type: none"> 1. Consolidate, reinforce, and deepen previously learned phonetic knowledge; gain a preliminary understanding of reading-aloud techniques and rules of phonetic changes in connected speech, such as liaison, loss of plosive, and assimilation; achieve basically correct pronunciation and intonation. 2. Practice intonation in declarative, interrogative, and imperative sentences; can answer classroom questions using simple English; can conduct basic multi-turn conversations on everyday topics. 3. Use corresponding learning materials to express personal opinions, feelings, and viewpoints. 4. Focus on training students to discuss topics related to their studies or future work. <p>Reading:</p> <ol style="list-style-type: none"> 1. Be able to read and comprehend general-topic English passages with the aid of a dictionary. 2. Be able to employ fast reading skills with materials of appropriate length and moderate difficulty. 3. Be able to basically read English newspapers and magazines from

	<p>China and abroad, grasp the central idea, and understand the main content and relevant information.</p> <p>4. Be able to read common practical writing styles encountered in daily life, learn reading techniques, and acquire proficient reading skills.</p> <p>Writing:</p> <ol style="list-style-type: none"> 1. Master writing techniques for general genres such as narratives, argumentative essays, and expository writing. 2. Master commonly used vocabulary and sentence patterns for practical writing styles. 3. Be able to take notes, answer questions, and write outlines and summaries based on written materials of similar difficulty to the course texts. 4. Be able to write a short essay of 120-150 words within half an hour on a given topic, based on an outline, table, or diagram. 5. Be able to write everyday practical writings (e.g., letters, resumes). <p>Translation:</p> <ol style="list-style-type: none"> 1. Master commonly used translation techniques. 2. Can perform English-Chinese and Chinese-English translation of texts on familiar topics with the aid of a dictionary. The translation should be basically fluent and employ appropriate translation techniques. <p>● Skill:</p> <p>Listening:</p> <p>Can understand general everyday English conversations; can basically comprehend slower-paced audio and video materials as well as lectures on familiar topics, grasping the main idea and key points. Can understand English courses taught in English at a corresponding level; can understand common instructions, product descriptions, or operational manuals related to their job positions. Can employ listening strategies effectively.</p> <p>Speaking:</p> <p>Can conduct brief, multi-turn conversations in English on everyday topics; can provide simple narration or description of general events and objects; can basically express personal opinions, feelings, and viewpoints; can engage in simple discussions on topics related to studies or future work. Language expression is relatively clear in structure; pronunciation, intonation, and grammar generally conform to communicative norms. Can employ oral communication strategies effectively.</p> <p>Reading:</p> <p>Can read English newspaper articles and other English materials on familiar topics with moderate linguistic difficulty; can read English textbooks and common practical writings or simple professional materials encountered in future work and daily life with the aid of a dictionary, understanding the main facts and relevant details. Can employ reading strategies effectively to comprehend the author's viewpoint, grasp the central idea, and predict, analyze, infer, judge, and</p>
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	<p>synthesize the content of a text.Can appropriately adjust reading speed and methods according to different reading purposes and the difficulty of the material.Can read review literature related to their major or materials such as manuals and operational handbooks related to future work.</p> <p>Writing:</p> <p>Can master writing techniques for general genres such as narratives,argumentative essays,and expository writing; can master commonly used vocabulary and sentence patterns for practical writing styles.Can take notes,answer questions,and write outlines and summaries based on written materials of similar difficulty to course texts.Can write a short essay of 120-150 words within half an hour on a given topic,based on an outline,table,or diagram.Can complete everyday practical writings (e.g.,letters,resumes).Writing is generally relevant to the topic,with complete content,clear logic,coherent organization,smooth sentences,and relatively cohesive discourse featuring varied sentence patterns.Can employ common written expression and communication strategies effectively.</p> <p>Translation:</p> <p>With the aid of a dictionary,translating between English and Chinese texts on familiar topics,with clear structure and general linguistic difficulty.The translation is relatively accurate,without major errors in understanding or expression.Can extract and translate materials of familiar genres or those related to their major or future job positions,with general linguistic difficulty.Can effectively employ translation techniques.</p> <p>● Competence:</p> <p>To cultivating students' ability to understand and interpret Chinese culture,thereby contributing to the global dissemination of Chinese culture.The core of humanistic education is people-oriented,promoting human values and emphasizing the cultivation of comprehensive qualities and holistic development.Integrating course content,socialist core values are organically incorporated into the teaching materials of College English.Therefore,it is essential to explore the rich humanistic connotations of the College English course and achieve an organic unity of its instrumental and humanistic dimensions.</p>
Content	<p>A.Theoretical teaching(42 contact hours) theory teaching (42 class hours)</p> <p>Unit 1 The Pursuit of Dreams</p> <p>1.1 Opener</p> <p>1.2 Reading & Interacting</p> <p>1.3 Language Focus</p> <p>1.4 Viewing & Listening</p> <p>1.5 Speaking</p> <p>1.6 Writing: Text Writing & CET-4 Writing</p> <p>Unit 2 Freshman Year</p>

	<p>2.1 Opener 2.2 Reading & Interacting 2.3 Language Focus 2.4 Viewing & Listening 2.5 Speaking 2.6 Writing: Text Writing & CET-4 Writing Unit 3 True Stories of Nazi Germany 3.1 Opener 3.2 Reading & Interacting 3.3 Language Focus 3.4 Viewing & Listening 3.5 Speaking 3.6 Writing: Text Writing & CET-4 Writing Unit 5 The Water Problem 5.1 Opener 5.2 Reading & Interacting 5.3 Language Focus 5.4 Viewing & Listening 5.5 Speaking 5.6 Writing: Text Writing & CET-4 Writing Unit 6 Going offline 6.1 Opener 6.2 Reading & Interacting 6.3 Language Focus 6.4 Viewing & Listening 6.5 Speaking 6.6 Writing: Text Writing & CET-4 Writing Unit 1 Youth on the rise 1.Video: The Chinese Dream: A path to national rejuvenation 2.Text:The future is in your hands 3.Skill: Delivering a speech on the Chinese dream Unit 2 Planting seeds,harvesting the future Video: Innovation and equality in basic education 2.Text: Where knowledge meets craft 3.Skill: Delivering an oral report on China’s education Part B.Motivate teaching(6 contact hours) Periodical exams for listening and speaking; reading; writing and translating,two hours for illustration and simulating test for Band-4 examination.</p>
Examination forms	Closed-book written exam
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted. ●The usual score of 100 points,accounting for 50 % of the total score; it is composed of assignments and periodic examinations,which are as follows: 1) 20 points for listening,2) 10 points for speaking,3) 30

	<p>points for reading,4) 20 points for writing,5) 20 points for translation. The average score of homework is 45 points,and the total number of homework is not less than 8 times (online or offline).The assessment contents and scores are as follows: (1) 10 points for listening,(2) 5 points for speaking,(3) 10 points for reading,(4) 10 points for writing,(5) 10 points for translation</p> <p>The total number of tests is not less than 6 times (completed online or offline).The assessment contents and scores are as follows: (1) 10 points for listening,(2) 5 points for speaking,(3) 20 points for reading,(4) 10 points for writing,(5) 10 points for translation.</p> <p>The average score accounts for 50 %,and the final score (closed-book written test) accounts for 50 %.</p> <p>Total score (100 points) = usual score 100 points (50 %) + final score 100 points (50 %).</p>
Reading list	<p>1. Required books</p> <p>[1] Menghua Li,Chief editor,New Progressive Integrated College English.1-2 Shanghai Foreign Languages Education Press,1st edition,June, 2023.</p> <p>[2] Shouren Wang,Chief editor,New College English Viewing and Speaking,1-2 Foreign Language Teaching and Research Press,1st edition,July, 2022.</p> <p>[3] Reference Committee of Higher Institution of Educational Ministry,Guidance of College English Teaching 2020,Higher Educational Press,Oct.2020.</p> <p>2.Reference books</p> <p>[1] Ministry of Education,Guidance Outline of Subject’s Critical Thinking Construction of Higher Education May,2024.</p> <p>[2] Youshan Sun,Chief Editor,Understanding Contemporary China Integrated Course of College English (Book I),Foreign Language Teaching and Research Press ,1st edition,2025</p>
Data of last mendment	June 29,2025

Introduction to Environmental Science

Module designation	introduction to environmental science
Semester(s) in which the module is taught	Semester 1
Person responsible for the module	Chen Songyue
Language	Chinese
Relation to curriculum	Introduction to Environmental Science is one of the compulsory courses of natural science in electronic information engineering. It is to understand and evaluate the influence of professional engineering practice on the sustainable development of environment and society by using the relevant knowledge of environmental protection and sustainable development. The course mainly focuses on China's environmental protection policy and sustainable development strategic thinking; water, soil, noise and air pollution and control; treatment and utilization of solid waste; environmental quality assessment and environmental monitoring.
Teaching methods	Teacher-centered method; Case method; Questioning method; Discussion method.
Workload (incl. contact hours, self-study hours)	Total workload = 30 where: contact hours = 16, self-study hours = 14
Credit points (ECTS)	ECTS Credit=1.0
Required and recommended prerequisites for joining the module	Higher Mathematics I
Module objectives/intended learning outcomes	<p>Course objective 1: to consider environmental factors in the design.</p> <p>Course Objective 2: Be familiar with the environmental protection norms, standards and laws and regulations related to electronic information engineering, and be able to identify and analyze the potential impact of the application of materials, technologies and processes related to electronic information engineering on society, health, safety, law and culture.</p> <p>Course objective 3: to be familiar with the significance of environmental protection and social sustainable development, and to understand the impact of engineering design and construction on environmental and social sustainable development. The knowledge of environmental protection and sustainable development can be used to evaluate t</p>

	he impact of engineering practice on the sustainable development of environment and society.
Content	<p>(1) Introduction 1) Environmental overview; 2) Sustainable development and environment; 3) Ecosystem and environment; 4) Environmental protection.(2 hours; 1 self-study)</p> <p>(2) Air pollution and control 1) Overview; 2) The diffusion of air pollutants; 3) Air pollution control project; 4) Global atmospheric environmental problems.(2 hours; 2 self-study hours)</p> <p>(3) Water pollution and control 1) Overview; 2) physical treatment method; 3) Biological treatment; 4) physical chemistry and chemical treatment; 5) Water treatment system.(4 hours; 3 self-study hours)</p> <p>(4) Noise pollution and control 1) Noise and hazards; 2) Noise measurement and standard; 3) Noise control method.(2 hours; 2 self-study hours)</p> <p>(5) Soil pollution and control 1) Overview of soil environment; 2) Soil pollution; 3) China's soil pollution prevention and management laws and regulations; 4) Soil pollution remediation technology.(2 hours; 2 self-study hours)</p> <p>(6) Treatment and utilization of solid waste 1) Overview; 2) Principles of solid waste management; 3) Solid waste treatment technology.(2 hours; 2 self-study hours)</p> <p>(7) Environmental quality assessment and environmental monitoring 1) Environmental quality management; 2) Environmental quality assessment; 3) Environmental monitoring.(2 hours; 2 self-study hours)</p>
Examination forms	Open-book written examination is adopted
Study and examination Requirements	<p>1.Students should independently complete the homework after each class.Late arrivals,early departures or unauthorized absences are not permitted.</p> <p>2.This course is evaluated in a combination of usual performance and final exam results,comprehensively assessing students' learning situation,ability to analyze and solve engineering problems related to the environment.</p> <p>The usual performance evaluation standard is 20 %,including homework (8 %) and attendance (12 %); the final examination accounted for 80 %.</p> <p>4.Each achievement is evaluated by the percentage system,and 60 is the passing score of this course.</p>
Reading list	<p>Required reading list</p> <p>[1] Yang et al.,Introduction to Environmental Science [M].Higher Education Press,2010;</p> <p>[2] Zhu et al.,Introduction to Environmental Engineering [M].Science Press,2016;</p> <p>[3] Liu et al.,Introduction to Environmental Protection [M].Chemical Industry Press,2010;</p> <p>[4] Lin Zhaoxin et al.Introduction to Environmental Protection [M].Higher Education Press,2006.</p>
Data of last mendment	January 7,2026

Engineering Drawing

Module designation	engineering drawing
Semester(s) in which the module is taught	Semester 2
Person responsible for the module	Chen Guang
Language	Chinese
Relation to curriculum	<p>'Engineering Drawing' is a compulsory subject basic course for non-mechanical undergraduate majors to cultivate advanced engineering and technical applied talents. The main contents of this course are the basic knowledge, skills and orthographic projection basis (including national standards, graphic drawing, orthographic projection basis), projection (including basic three-dimensional projection, combined three-dimensional view), machine expression method (including view, section view, section view) and electrical drawing. The course is closely related to engineering practice. It is a basic course of engineering graphics technology to cultivate students' image thinking and spatial thinking ability, master scientific thinking methods, and master the use of modern drawing tools and methods. This course is the basic platform for students to learn about follow-up courses.</p>
Teaching methods	<p>Teacher-centered method; Case method; Questioning method; Discussion method.</p>
Workload (incl. contact hours, self-study hours)	Total workload = 105, of which: contact hours = 40, self-study hours = 65
Credit points (ECTS)	ECTS Credit= 3.5
Required and recommended prerequisites for joining the module	Nil
Module objectives/ intended learning outcomes	<p>learning outcome</p> <p>●knowledge:</p> <ol style="list-style-type: none"> 1. Understand the national standards and norms of engineering drawing; 2. master the basic knowledge and skills of mapping, including projection principle, view expression method, dimensioning; 3. master the drawing and reading of professional maps. <p>●skill:</p>

	<p>1.be able to skillfully use the basic methods of drawing and reading engineering drawings;</p> <p>2.Have the ability to accurately express the engineering professional drawings;</p> <p>3.Possess space imagination ability,image thinking ability and innovation ability.</p> <p>●capacity:</p> <p>1.Combined with the characteristics of engineering drawing knowledge,under the main line of carrying out the national drawing standards and following the projection principle,we should constantly guide students to draw carefully and strictly,establish the idea of being responsible for production,and cultivate a good working style;</p> <p>2.Cultivate students to have rigorous scientific thinking and meticulous,realistic and pragmatic craftsman spirit;</p> <p>3.Have the feelings of home and country,professional quality and professional ethics.</p>
Content	<p>1.Basic knowledge and skills,orthographic projection basis (contact hours: 10; self-study hours 16)</p> <p>The basic provisions of the national standard of drawing; drawing tools and their use; geometric drawing; the analysis and drawing of plane graphics; basic training assignments; overview of projection method; the formation and projection law of three views; projection of point,line and plane.</p> <p>2.Projection map (contact hours: 22; self-study hours 36)</p> <p>The projection of the basic body; plane and three-dimensional intersection; three-dimensional and three-dimensional intersection; the basic concept of axonometric drawing; positive isometric side diagram; oblique two-axis mapping; axonometric drawing large operation; the composition and shape analysis of the combination; the drawing of the three views of the combination; the reading of the combination view; combination of large operations.</p> <p>3.Machine expression method and electrical diagram (contact hours: 8; self-study hours 13)</p> <p>view; cutaway view; sectional diagram; the basic concept of electrical engineering drawing,simple electrical graphics.</p>
Examination forms	The closed-book written examination method is adopted.
Study and examination Requirements	<p>1.Students should independently complete the homework after each class.Late arrivals,early departures or unauthorized absences are not permitted.</p> <p>2.This course is evaluated in a combination of usual performance and final exam results,comprehensively assessing students' learning situation,ability to analyze and solve complex engineering problems.</p> <p>The usual performance evaluation standard is 30 %; the final examination accounted for 70 %.</p> <p>4.Each achievement is evaluated by the percentage system,and 60 is the passing score of this course.</p>
Reading list	<p>Required reading list</p> <p>1.Using textbooks: edited by Chen Guang.'Engineering drawing'.Beijing: China Electric Power Publishing House,2019.8</p> <p>2.Reference materials: Dong Xiangguo,Li Shilan and other editors.'Basic of</p>

09 Module Descriptions

	Engineering Drawing' (Fourth Edition).Beijing: Higher Education Press,2019.12 3.Reference book: issued by the National Development and Reform Commission of the People's Republic of China.'Engineering drawing standard'.Beijing: Engineering Industry Press,2008
Data of last mendment	2026.02.06

Probability Theory and Mathematical Statistics I

Module designation	Probability Theory and Mathematical Statistics
Semester(s) in which the module is taught	1th semester
Person responsible for the module	Zhang Lulu
Language	Chinese
Relation to curriculum	Probability Theory and Mathematical Statistics is an important basic course of natural science. The problems it studies widely exist in various fields of technical science, and the methods it introduces are widely used in various disciplines. It is a compulsory basic course for students of science and engineering in the whole college. Through the study of this course, students can master the basic knowledge, basic theory and basic methods of 'probability theory and mathematical statistics', and lay a good mathematical foundation for students to apply the knowledge of 'probability theory and mathematical statistics' in natural science and engineering technology.
Teaching methods	1. Lecture method; 2. Case method; 3. Discussion method; 4. Blended teaching method;
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	higher mathematics
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. random events, the definition and properties of probability, the basic probability model; the concept and properties of one-dimensional two-dimensional random variables, the concept and properties of random variable distribution function and the calculation method; 3. The concept and properties of digital features; law of large numbers and central limit theorem; 4. Basic concepts of mathematical statistics; the basic principle of parameter estimation; the basic principle of hypothesis testing; ● Skill: <ol style="list-style-type: none"> 1. Master the relationship and operation of random events; the calculation method of the probability of random events; 2. master the distribution of random variables, the distribution of random variable function calculation method;

	<p>3.Calculation of digital features; the application of law of large numbers and central limit theorem;</p> <p>4.calculation of parameter estimation; application of hypothesis testing.</p> <p>● Competence:</p> <p>1.Possess the ability to abstractly summarize the problem;</p> <p>2.Logical reasoning ability;</p> <p>3.have the ability to use basic knowledge and basic theory to analyze and solve problems.</p>
Content	<p>Part A.Theoretical teaching(48 contact hours; 42 self-study hours)</p> <p>Chapter 1 Random events and probabilities (8 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●Randomized trials,sample space,random events,frequency and probability; ●Equal-possibility probability (classical probability); ●conditional probability; ●Independence; <p>Chapter 2 One-dimensional random variable and its probability distribution (8 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●The definition of random variables,the probability distribution of discrete random variables; ●Continuous random variables; ●The distribution function of random variables; ●The distribution of random variable function; <p>Chapter 3 Multidimensional random variable and its probability distribution (8 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●Two-dimensional random variables; ●Edge distribution and independence of random variables; ●The distribution of two random variable functions; ●n-dimensional random variable <p>Chapter 4 digital characteristic (8 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●mathematical expectation; ●Variance; ●Covariance and correlation coefficient; ●Moment and covariance matrix; <p>Chapter 5 Law of Large Numbers and Central Limit Theorem (2 contact hours; 2self-study hours)</p> <ul style="list-style-type: none"> ●Law of large numbers,central limit theorem; <p>Chapter 6 Sample and sampling distribution (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Random samples,sampling distribution; ●Frequency distribution histogram and empirical distribution function; <p>Chapter 7 parameter estimation</p>

	<p>(6 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●The evaluation criteria of point estimation and estimator; ●Interval estimation,interval estimation of normal population mean and variance; ●Unilateral confidence interval; <p>Chapter 8 hypothesis testing</p> <p>(4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Hypothesis testing principle and steps,single normal population hypothesis testing; ●Hypothesis testing of two normal populations;
Examination forms	Closed-book written exam.
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include two parts: usual assessment and final assessment.Among them:</p> <ul style="list-style-type: none"> ●The usual performance accounted for 30 %,including comprehensive evaluation (60 %) and stage assessment (40 %).The comprehensive evaluation includes: attendance,homeework,classroom discussion and in-class test using the learning platform. ●The final grade accounted for 70 %.
Reading list	<p>[1] Wang valuable editor.'Probabilistic and Mathematical Statistics' (First Edition).Beijing: Science Press,2015.</p> <p>[2] Sheng Jue,editor-in-chief of Zhejiang University.' Probability Theory and Mathematical Statistics' (Fifth Edition).Beijing: Higher Education Press,2019.</p> <p>[3] Wang Diankun editor.' Probability Theory and Mathematical Statistics' (First Edition).Beijing: Science Press,2021.</p>
Data of last mendment	June 29,2025

College Physics Experiments II

Module designation	college physics experiment II
Semester(s) in which the module is taught	Semester 2
Person responsible for the module	Xu Jing
Language	Chinese
Relation to curriculum	<p>Physics is an experimental science. The establishment of the basic concepts of physics, the discovery of basic laws, and the formation of basic theories are all based on strict physical experiments. College physics experiment course is an independent and compulsory basic course for students majoring in smart grid information engineering to carry out scientific experiment training. It is the beginning of students' systematic experimental methods and experimental skills training after entering the university. It is an important means for students to carry out scientific experiment training. Through the teaching of this course, students are trained to master the basic theories and methods of experiments. To cultivate students with strong scientific experiment ability and practical ability; cultivate students' rigorous thinking ability and innovative spirit, especially the comprehensive ability to adapt to the development of modern science and technology; consolidate and deepen the understanding of the basic concepts and theories of physics; through the application of theory and the analysis of physical phenomena, students' ability to analyze and solve problems is fully improved. It lays a good scientific experimental foundation for future study and work.</p>
Teaching methods	Classroom teaching; Heuristic teaching method; Discussion-based teaching
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points (ECTS)	ECTS Credit = 2.0
Required and recommended prerequisites for joining the module	higher mathematics
Module objectives/ intended learning outcomes	Curriculum objectives: Objective 1: Through the study of basic knowledge, basic methods, basic skills, error theory and data processing methods of scientific experiments, it

	<p>has the ability to preliminarily process scientific experiments.</p> <p>Objective 2: To cultivate students' scientific experimental ability and innovative consciousness through standardized experimental instrument operation, measurement data acquisition and processing, experimental error analysis, and independent completion of simple design experimental projects.</p> <p>Graduation Requirements Indicators: The experimental system can be constructed according to the experimental scheme of electronic circuit or electronic information system, and the experiment can be carried out safely and the experimental data can be collected correctly.</p>
Content	<p>Introduction</p> <p>Basic theory of measurement error</p> <p>Modification and calibration of electric meter;</p> <p>the adjustment and use of Michelson interferometer;</p> <p>determination of photoelectric effect and Planck constant;</p> <p>the magnetic field is measured by the Hall effect method and the conductivity of the sample is measured;</p> <p>measurement of acoustic velocity;</p> <p>the elastic modulus of metal wire was measured by static tensile method.</p> <p>The curvature radius of the lens is measured by equal thickness interference method.</p> <p>Design experiment.</p>
Examination forms	<p>The assessment of the course is to check the students' mastery and ability of each knowledge point, including the usual assessment and the experimental report assessment. The usual assessment includes attendance and experimental operation standardization; the experimental report examines the standardization of the experimental report. The total score of the course is composed of two parts: the usual assessment score and the experimental report assessment score.</p>
Study and examination Requirements	<p>Average score of 100 points:</p> <p>(1) The usual performance consists of three parts: attendance, stage test and experimental operation.</p> <p>(2) Attendance accounted for 50 %, stage test accounted for 50 %.</p> <p>(3) The usual score multiplied by its proportion in the total score of 0.2 included in the total score of the course.</p> <p>Experimental report part 100 points:</p> <p>(1) The experimental report consists of experimental process and experimental data processing.</p> <p>(2) The score of the experimental report is 100 points, and the scores of the corresponding course objectives 1 and 2 are 20 points and 80 points respectively.</p> <p>The report score multiplied by its proportion in the total score of 0.8 was included in the total score of the course.</p> <p>(3) Experimental reports include: 7 conventional experimental reports (mechanics, heat, electromagnetics, modern physics experiments, etc.), 1 design experimental report. According to the teaching objectives of the course and the requirements of knowledge points and ability points, the writing of the experimental report is standardized, and the experiment should be comprehensively summarized. The experimental report includes: 1) experimental purpose; 2) Experimental instruments; 3) Experimental principle; 4) Experimental steps; 5) original data record; 6) Experimental data processing and conclusions. While writing the report, students need to</p>

09 Module Descriptions

	master the knowledge points and ability points of the relevant chapters of the textbook, and use the theoretical knowledge of the experiment to solve the complex problems in electronic information engineering.
Reading list	Jiang Yi and other editors. 'University Physics Experiment'. Science Press, 2018. Li Xuehui and other editors. 'University Physics Experiment'. Higher Education Press, 2018. Xu Jianqiang and other editors. 'College Physics Experiment Tutorial'. Science Press, 2019
Data of last mendment	June 29, 2025

College Physics I

Module designation	College Physics I
Semester(s) in which the module is taught	2nd and 3rd semester
Person responsible for the module	Yu Yue
Language	Chinese
Relation to curriculum	<p>This course is a public basic course of electronic specialty. Physics is a subject that studies the basic structure, interaction and the most basic and common form of motion of matter and its mutual transformation law. The research object of physics is of great universality. Its basic theory permeates all fields of natural science and is widely used in various departments of production technology. It is the foundation of natural science and engineering technology, and also the source and forerunner of many high-tech development. Therefore, 'College Physics' course is an important compulsory basic course for students of science and engineering. Through the teaching of this course, students can master the basic knowledge of physics more systematically, learn scientific thinking methods and research methods, improve students' ability to analyze and solve problems by applying the knowledge they have learned, enhance students' innovative consciousness and innovative ability, cultivate students' scientific world outlook, improve students' scientific quality, and strive to achieve the coordinated development of knowledge, ability and quality. It also lays the necessary physical foundation for the study of subsequent professional foundation and professional courses and further acquisition of relevant knowledge.</p>
Teaching methods	1. Lecture method; 2. Method of discussion; 3. Blended teaching method.
Workload (incl. contact hours, self-study hours)	Total workload = 180 hours Contact hours = 96 hours Self-study hours = 84 hours
Credit points (ECTS)	ECTS Credit = 6.0
Required and recommended prerequisites for joining the module	higher mathematics
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. Kinematics and dynamics of particle, kinematics and dynamics basic knowledge and basic theorem law of rigid body fixed axis rotation; basic knowledge and basic laws of mechanical vibration and mechanical wave; gas kinetic theory and basic knowledge of thermodynamics; the basic</p>

	<p>properties and basic laws of electromagnetic field; theoretical basis of wave optics.</p> <p>2.Comprehensive use of Newton's law of motion and conservation law to solve the problem of complex mechanical system; according to the known conditions,the mathematical expressions of the vibration model and the wave model are determined,and the practical significance of the vibration and wave synthesis decomposition is understood.To understand and master the quantitative relationship between macro-physical quantities and micro-physical quantities; according to the basic law of thermodynamics,the thermodynamic process is analyzed,and the thermal power conversion efficiency of the quasi-static cycle process is quantitatively calculated.The field strength and potential are calculated by using the theorem and law of electrostatic field.Using the theorem and law of steady magnetic field to solve the general problem of magnetic field; master Faraday's law of electromagnetic induction; to understand the nature of motional electromotive force and induced electromotive force; solve the interference and diffraction problems in wave optics.</p> <p>● Skill:</p> <p>1.Be able to systematically understand and understand the basic knowledge,basic theory,physical concepts and physical laws in the course.</p> <p>2.Be able to understand and master the basic physical laws,to use physical language and basic mathematical knowledge to solve practical physical problems.</p> <p>● Competence:</p> <p>1.Through the study of college physics courses,we can fully and systematically understand the basic knowledge,basic theory and basic methods in the course,and can correctly explain the physical concepts and physical laws in the course.</p> <p>2.According to the physical theory and research methods,we can accurately use the physical language and basic mathematical knowledge to describe,analyze,study and solve practical physical problems,and provide basic ability training for professional problem processing.</p>
Content	<p>2nd Semester.Theoretical teaching (48 contact hours; 42self-study hours)</p> <p>Chapter 1 particle mechanics (14 contact hours; 12self-study hours)</p> <ul style="list-style-type: none"> ●Description of particle motion; ●Description of curvilinear motion,circular motion; ●Two kinds of problems in kinematics; ●The application of Newton's law of motion and Newton's law of motion; ●The momentum theorem and the law of conservation of momentum of particle and particle system; ●Dynamic energy theorem,conservative force work,potential

	<p>energy,functional principle,the law of conservation of mechanical energy.</p> <ul style="list-style-type: none"> ●exercise class <p>Chapter 2 Foundations of rigid body mechanics (12 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ●The description,moment,moment of inertia and rotation law of rigid body fixed axis rotation; ●The application of rotational inertia and rotational law; ●The angular momentum of the particle and the angular momentum of the rigid body,the angular momentum theorem and the conservation law of the rigid body rotating around the fixed axis; ●The theorem of dynamic energy and the law of conservation of mechanical energy of moment work,rigid body rotation around the fixed axis. <ul style="list-style-type: none"> ●exercise class ●quizzes <p>Chapter 3 vibration and waves (12 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ●The amplitude,period,frequency and phase of simple harmonic vibration and simple harmonic vibration; ●Rotation vector representation; ●The energy of simple harmonic vibration,the synthesis of simple harmonic vibration; ●The formation of mechanical wave,wavelength,period and wave velocity,wave function of plane simple harmonic wave; ●Wave energy,Huygens principle,wave superposition and interference. <ul style="list-style-type: none"> ●exercise class <p>Chapter 4 thermology (10 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● The ideal gas state equation,the statistical interpretation of the pressure and temperature of the ideal gas,the energy equalization theorem,the internal energy of the ideal gas; ●Quasi-static process; work,heat,internal energy,the first law of thermodynamics; ●Gas molar heat capacity; isothermal process,adiabatic process; ●Cycle process,Carnot cycle. <ul style="list-style-type: none"> ●exercise class <p>3rd Semester.Theoretical teaching (48 contact hours; 42 self-study hours)</p> <p>Chapter 5 electromagnetism (32 contact hours; 28 self-study hours)</p> <ul style="list-style-type: none"> ●Quantization of charge and conservation law,Coulomb's law,electric field,electric field intensity ●Electric field intensity flux,Gauss theorem and its application ●The work of electric field force,the loop theorem of electrostatic field,potential energy and potential ●conductor in electrostatic field ●Dielectric in electrostatic field
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	<ul style="list-style-type: none"> ●Capacitor, capacitance, energy of electrostatic field, energy density of electric field ●exercise class ●Magnetic field, magnetic induction intensity, Biot-Savart law and its application ●The magnetic flux, the Gauss theorem of magnetic field, the Ampere loop theorem and its application ●The current-carrying wire is stressed in the magnetic field ●The effect of magnetic field on current carrying coil, the movement of charged particles in electric field and magnetic field ●exercise class ●quizzes ●Electromagnetic induction phenomenon, electromagnetic induction law, Lenz's law ●Motional electromotive force, induced electromotive force ●Self-inductance and mutual inductance, magnetic field energy, magnetic field energy density <p>Chapter 6 wave optics (12 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ●Coherent light, double-slit interference, optical path ●Thin film interference, wedge interference ●Diffraction of light, single slit diffraction ●Circular hole diffraction, optical instrument resolution ability ●Grating diffraction ●Polarization of light, acquisition and test of polarized light, polarization in reflection and refraction <p>Chapter 7 modern physical (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Special theory of relativity, space-time view, ●The basis of quantum mechanics.
Examination forms	Closed-book written exam.
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete their homework independently. Late arrivals, early departures or unauthorized absences are not permitted. The assessment methods of this course include two parts: the usual assessment and the final assessment. Among them: ●The usual performance accounts for 30 %, including homework (70 %), stage test (20 %), and other links (10 % in-class practice, topic discussion, etc.). ●The final grade accounted for 70 %.
Reading list	<p>[1]. Zhao Jinfang editor. 'University Physics' (4th Edition). Beijing University of Posts and Telecommunications Press, 2014.11</p> <p>[2]. Edited by Ma Wenwei. 'Physics' (6th Edition). Higher Education Press, 2014.08</p> <p>[3]. Editor Zhang Sanhui. ' University Physics' (4th Edition). Tsinghua University Press, 2018.12</p> <p>[4]. Editor-in-chief Cheng Shouzhu. 'General Physics' (7th Edition), Higher Education Press, 2016.05</p>

09 Module Descriptions

Data of last mendment	June 29,2025
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complex variable function

Module designation	complex variable function
Semester(s) in which the module is taught	Semester 3
Person responsible for the module	Gu zhaosheng
Language	Chinese
Relation to curriculum	'Complex variable function' is a mathematics subject that studies the analysis process of complex value function of complex independent variables. It is a basic course to cultivate students' basic analysis ability and a compulsory course for electrical and control majors. The contents of this course mainly include: complex variable function, analytic function, integral of complex variable function, series representation of analytic function, Fourier transform and Laplace transform. Through the study of this course, students can master the basic concepts, theories and methods of complex variable function, and can reasonably describe and simplify practical engineering problems by using the analysis characteristics of complex variable function theory. It provides the necessary theoretical analysis tools for the study of follow-up professional courses, and lays a good mathematical foundation for further engineering and scientific research work.
Teaching methods	Teacher-centered method; Case method; Questioning method, Discussion method
Workload (incl. contact hours, self-study hours)	Total workload = 75 hours Contact hours = 40 hours Self-study hours = 35 hours Total workload = 75, of which: contact hours = 40, self-study hours = 35
Credit points (ECTS)	ECTS Credit=2.5
Required and recommended prerequisites for joining the module	higher mathematics
Module objectives/ intended learning outcomes	<p>Learning outcomes</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Complex number and complex function, analytic function. 2. Integral and series of complex variable function. 3. Integral transform and its application. ● Skill: <p>It can carry out the basic operation of complex numbers, the description of curves and regions in the complex plane, and the derivation operation of</p>

	<p>complex variable functions. It has the ability to judge the existence, continuity, derivation and analysis of the limit of complex variable functions, so that students have certain knowledge transfer ability, abstract generalization ability and logical reasoning ability.</p> <p>It has the ability to expand the analytic function into Taylor series and expand the simpler function into Laurent series in different ring domains, so that students can realize the unique thinking mode of complex variable function in dealing with problems, and promote the further improvement of students' logical reasoning ability, and provide the necessary basis for students to learn subsequent courses and mathematical knowledge.</p> <p>● Competence:</p> <p>1. Fourier transform and Laplace transform that can calculate typical functions, have the ability to skillfully apply Laplace transform to solve differential equations, further train and improve students' ability to analyze and solve problems, lay a solid mathematical foundation for further study of follow-up courses and modern science and technology, and provide students with applicable mathematical methods and calculation methods for scientific research and practical work.</p> <p>The language tools of mathematics, natural science and engineering science can be used to express the complex engineering problems of electronic information.</p>
Content	<p>Theoretical teaching(40 contact hours; 35 self-study hours)</p> <p>Chapter 1 Complex number and complex variable function (8 contact hours; 7 self-study hours)</p> <p>Complex number and its algebraic operation, the geometric representation of complex number; the power and root of the complex number; region, complex variable function, the limit and continuity of complex variable function.</p> <p>Chapter 2 Analytic Functions (6 contact hours; 5 self-study hours)</p> <p>Main teaching contents: derivative and differential of complex variable function; the definition of analytic function, the necessary and sufficient conditions of function analysis; the definition, analytic properties and operational properties of elementary functions (exponential function, logarithm, power function, trigonometric function, inverse trigonometric function).</p> <p>Chapter 3 Integral of complex function (8 contact hours; 7 self-study hours)</p> <p>The definition, properties and calculation of integral; Cauchy-Goursat basic theorem, compound closed circuit theorem, Cauchy integral formula, higher order derivative of analytic function; the relationship between analytic function and harmonic function.</p> <p>Chapter 4 Series Representation of Analytic Functions (8 contact hours; 7 self-study hours)</p> <p>The concept of complex term series, the concept of power series; the convergence radius and convergence circle of the power series, and the properties of the power series in the convergence circle; Taylor series; Laurent series.</p> <p>Chapter 5 Integral Transformation (10 contact hours; 9 self-study hours)</p> <p>Understand the concept of Fourier transform and its inverse transform, master the Fourier transform of some functions; understand the</p>

09 Module Descriptions

	concept of Laplace transform, pay attention to the difference and connection between it and Fourier transform; master the method of pulling transformation; to understand the properties of Laplace transform; understand the method of using pull-type inverse transformation; can skillfully apply Laplace transform to solve differential equations.
Examination forms	The closed-book written examination method is adopted
Study and examination Requirements	<p>1. Students should independently complete the homework after each class. Late arrivals, early departures or unauthorized absences are not permitted.</p> <p>2. This course is evaluated in a combination of usual performance, experimental performance and final exam results, and comprehensively evaluates students' learning situation, ability to analyze and solve complex engineering problems.</p> <p>The usual performance evaluation standard is 30 %, including homework (60 %) and stage assessment (40 %); the final examination accounted for 70 %.</p> <p>4. Each achievement is evaluated by the percentage system, and 60 is the passing score of this course.</p>
Reading list	<p>Required books</p> <p>1. Gao Zongsheng editor in chief. 'Complex Functions and Integral Transforms' (Second Edition). Beijing: Beijing University of Aeronautics and Astronautics Press, 2016</p> <p>2. Li Hong editor. 'Complex Functions and Integral Transformations' (Fifth Edition). Beijing: Higher Education Press, 2018</p> <p>3. Maberlin editor. 'Complex Functions and Integral Transforms' (First Edition). Beijing: Peking University Press, 2019</p> <p>4. Baoge Jun editor-in-chief. 'Complex Functions and Integral Transforms' (First Edition). Beijing: Science Press, 2021</p> <p>5. Zhong Yuquan editor. 'The Theory of Complex Variable Functions' (5th Edition). Beijing: Higher Education Press, 2021</p>
Data of last amendment	September 23, 2025

Fundamentals of College Computer

Module designation	Fundamentals of College Computer
Semester(s) in which the module is taught	1th semester
Person responsible for the module	Liu Chao
Language	Chinese
Relation to curriculum	'University Computer Foundation' is a public basic course of electronic information specialty.It is also a public basic course of computer in ordinary colleges and universities.The training goal of 'emphasizing application and emphasizing practice' is emphasized.The course content mainly includes the first knowledge of computer,operating system Windows 7,document processing Word 2010,database basic knowledge and Access database,multimedia technology and computer network.
Teaching methods	1.Lecture method; 2.Case method; 3.Discussion method; 4.Blended teaching method; 5.Experimental method.
Workload (incl.contact hours, self-study hours)	Total workload = 90 hours Contact hours = 32 hours Self-study hours = 58 hours Total workload = 90,of which: theoretical hours = 32,self-study hours = 58
Credit points (ECTS)	ECTS Credit=3.0
Required and recommended prerequisites for joining the module	No
Module objectives/ intended learning outcomes	<p>1.curriculum goals</p> <p>This course aims to help non-computer majors systematically master basic computer knowledge and basic operating skills,understand the role of information technology in modern society,cultivate computational thinking and information literacy,and lay a solid foundation for subsequent professional learning and digital life.</p> <p>2.Expected learning outcomes</p> <ul style="list-style-type: none"> ● Proficiency in operating mainstream operating systems (such as Windows) for file management,system settings and routine maintenance. ● Using office automation software (Word,Excel,PowerPoint) to efficiently complete document editing,data analysis and

	<p>demonstration production.</p> <ul style="list-style-type: none"> ● Understand the basic concepts of multimedia technology,can use common tools to process image,audio or video material. ● Master the basic principles of database,can use Access or similar tools to create a simple database and perform query operations. ● Learn the basics of computer networks and the Internet,including IP addresses,browser usage,network security,and information ethics.
Content	<p>A.Theoretical teaching(20 contact hours; 46 self-study hours) theory teaching (16 class hours; 32 self-study hours) The first part: Basic knowledge of computer (1) Information technology and computer (2 hours; 2 self-study hours) (2) Hardware system (2 hours; 4 self-study hours) (3) Operating system principle and application (2 hours; 4 self-study hours) The second part: Office office software,multimedia technology (1) office office software (2 hours; 6 self-study hours) (2) Multimedia technology (2 hours; 4 self-study hours) The third part: database principle and application,program design basis. (1) Database principle,Access database application software 1 (2 hours; 4 self-study hours) (2) database principle,Access database application software 2 (2 hours; 4 self-study hours) Part IV: Computer networks,information retrieval and information security Computer network foundation,information retrieval and information security (2 hours; 4 self-study hours) Part B.Experiment teaching(16 contact hours; 22 self-study hours) In order to help students better understand the basic operation of office and database,we will arrange the following eight typical experimental projects: Experiment 1: Operating system experiment (2 hours; 2 self-study hours) Experiment 2: office experiment 1 (2 hours; 4 self-study hours) Experiment 3: office experiment 2 (2 hours; 4 self-study hours) Experiment 4: multimedia experiment (2 hours; 4 self-study hours) Experiment 5: Access database experiment 1 (2 hours; 2 self-study hours) Experiment 6: Access database experiment 2 (2 hours; 2 self-study hours) Experiment 7: Network Experiment 1 (2 hours; 2 self-study hours) Experiment 8: network experiment 2 (2 hours; 2 self-study hours)</p>
Examination forms	Closed-book written exam

09 Module Descriptions

<p>Study and xamination Requirements</p>	<ul style="list-style-type: none"> ●Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted. ●The usual performance evaluation standard is 50 %,including homework (20 %),experiment (20 %) and stage assessment (10 %). The average score accounted for 50 %,and the final examination (closed-book written examination) accounted for 50 %.
<p>Reading list</p>	<p>[1] Liu Chao and so on.University Computer Basic Tutorial People's Post and Telecommunications Press 2024</p> <p>[2] Zhao Liying et al.University Computer Basic Experiment Tutorial People's Post and Telecommunications Press 2024</p>
<p>Data of last mendment</p>	<p>June 29,2025</p>

Basic Computer Programming (C Language)

Module designation	Basic Computer Programming (C Language)
Semester(s) in which the module is taught	2th semester
Person responsible for the module	Ms.Liu Chao
Language	Chinese
Relation to curriculum	'Computer Programming Foundation (C language)' is a compulsory public basic course for students after the ' University Computer Foundation' course.This course involves three basic structures of structured program design,basic data types and construction data types,functions,pointer types,etc.Through the study of this course,students can master the basic knowledge and programming skills of computer programming,cultivate students' thinking methods and basic abilities to solve and deal with practical problems by computer,and lay a foundation for further development of application programs to solve professional problems.
Teaching methods	1.Lecture method; 2.Case method; 3.Discussion method; 4.Blended teaching method; 5.Experimental method.
Workload (incl.contact hours, self-study hours)	Total workload = 120 hours Contact hours =48 hours Self-study hours = 72 hours
Credit points (ECTS)	ECTS Credit= 4.0
Required and recommended prerequisites for joining the module	university computer foundation
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.the representation of basic data types,operators and expressions that can describe the C language; 2.Be able to describe the three basic structures of structured program design; 3.Know the establishment and application of one-dimensional array,two-dimensional array and character array; 4.Know the definition and call of the function,the transfer of function parameters and the application of the function. 5.Understand the definition and reference of pointer variables,pointer operations,pointers and arrays. ● Skill:

	<p>1.Able to apply the basic theory of C language and programming thinking programming to solve practical problems;</p> <p>2.Visual C + +,Dev-C + + and other software tools can be used to solve exercises and common algorithms;</p> <p>3.According to the experimental requirements,we can independently complete the in-class experiment,and analyze the experimental results to get the correct conclusion.</p> <p>● Competence:</p> <p>4.Have the ability of engineering calculation;</p> <p>5.Programming ability based on C language;</p> <p>6.Have the ability to integrate theory with practice,analyze and solve practical engineering problems.</p>
Content	<p>Part A.Theoretical teaching(24 contact hours; 38 self-study hours)</p> <p>Chapter 1 Basic knowledge of C language (4 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●The development process of C language program; simple C language program; ●Data type; basic operators and expressions; <p>Chapter 2 Sequential structure program design (2 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Data input and output; ●Sequential structure; <p>Chapter 3 Select Structure Program Design (2 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●Three structures of if statement,if statement nesting; ●switch statement; <p>Chapter 4 Loop structure program design (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●while,do while loop; ●for loop statement; ●continue and break statements; ●Loop nesting; <p>Chapter 5 array (6 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●One-dimensional array; ●Two-dimensional array; ●String and character array applications; <p>Chapter 6 function (2 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ●The definition and call of function; transfer of parameters; ●Local variables and global variables; ●The storage category of variables; <p>Chapter 7 pointer (2 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●The basic concept of pointer; ●Pointers and arrays;

	<p>Part B.Exercise teaching(6 self-study hours)</p> <p>Part C.Experiment teaching(24 contact hours; 28 self-study hours)</p> <p>Experiment 1: Familiar with VC + + 6.0 programming environment. (2 contact hours; 4 self-study hours)</p> <p>Experiment 2: Sequential structure programming (2 contact hours; 4 self-study hours)</p> <p>Experiment 3: Selection of structural programming (2 contact hours; 4 self-study hours)</p> <p>Experiment 4-5: Loop Structure Programming (4 contact hours; 4 self-study hours)</p> <p>Experiment 6-8: Array programming (6 contact hours; 6 self-study hours)</p> <p>Experiment 9-10: Function programming (4 contact hours; 6 self-study hours)</p> <p>Experiment 11-12: Pointer (4 contact hours; 6 self-study hours)</p>
Examination forms	Closed-book examination
Study and examination Requirements	<ul style="list-style-type: none"> ●Students should complete the homework independently after each class.Late arrivals,early departures or unauthorized absences are not permitted. <p>The assessment methods of this course include three parts: usual assessment,final assessment and experimental assessment.Among them:</p> <ul style="list-style-type: none"> ●The usual performance accounted for 20 %,including comprehensive evaluation (10 %) and stage assessment (10 %).Among them,the comprehensive evaluation includes: attendance,homework,classroom discussion,and in-class test results assessed by the learning platform. ●The experimental results accounted for 20 %. ●The final grade accounted for 60 %.
Reading list	<p>[1] Su Xiaohong.Basics of programming (C language) (MOOC version) (2 nd edition) [M].Beijing: People's Post and Telecommunications Publishing House,2025.</p> <p>[2] Cao Liying.C Language Programming (Digital Textbook) [M].Beijing: Higher Education Press,2025.</p>
Data of last mendment	June 29,2025

C++ Programming

Module designation	C++ Programming
Semester(s) in which the module is taught	4th Semester
Person responsible for the module	Fu Haohai
Language	Chinese
Relation to curriculum	<p>This course is the core professional basic course of electronic information engineering, and it is the key link between computer basic and high-level professional courses.</p> <p>Advanced course: higher mathematics provides the basis of mathematical logic and data processing; computer basics make students familiar with the operating system and basic programming logic; the digital logic foundation lays the hardware cognitive foundation for understanding the software and hardware interaction and bit operation in C + +.</p> <p>Follow-up courses: provide necessary programming ability support for embedded system development, single-chip microcomputer principle, digital signal processing, data acquisition technology and other courses. C + + object-oriented thinking and hardware interactive programming can be directly applied to embedded drive development, signal algorithm implementation and other links of follow-up courses.</p>
Teaching methods	<p>Teaching methods: Teacher-Centered Methods; Lecture Method; Questioning Method; Discussion Method; Experimental Method</p> <p>Target Students: Electronic Information Engineering</p> <p>Teaching Type: Practical Teaching</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 75 hours</p> <p>Contact hours = 32 hours</p> <p>Self-study hours = 43 hours</p>
Credit points (ECTS)	ECTS Credit=2.5
Required and recommended prerequisites for joining the module	Fundamentals of Computer Science for College Students, C Programming, Fundamentals of Digital Logic
Module objectives/ intended learning outcomes	<p>Learning outcomes</p> <p>1. knowledge layer</p> <p>Master the C + + core syntax, including data types, operators, process control, arrays, strings, functions, pointers and references;</p> <p>understand the basic idea of object-oriented programming (OOP)</p>

	<p>(encapsulation,inheritance,polymorphism) and the implementation mechanism of classes and objects; master C + + memory management (new / delete) and basic engineering programming specifications; understand the application scenarios of C + + in electronic information engineering (embedded development,data acquisition,signal processing). 2.the level of skill capacity It can independently write,compile,debug and optimize C + + programs to solve simple data processing and logic control problems. Can use pointer,reference,dynamic memory efficient processing of variable length data (such as sensor signal sequence); can design and implement classes to encapsulate hardware modules (such as sensors,LED),complete object-oriented programming; the basic signal processing algorithm can be realized by using C + + to simulate simple hardware interaction. 3.Competence Have engineering programming thinking,can disassemble professional problems,design modular code solutions; have code specification awareness and fault-tolerant programming habits,adapt to the high reliability development requirements of electronic information engineering; have the ability of autonomous learning and problem solving,and can quickly master C + + to expand knowledge to adapt to subsequent professional courses;</p>
Content	<p>Part A Theory teaching: (16 face-to-face teaching,43 self-study) Module 1: C + + Foundation and Development Environment 1.Overview of C + + (characteristics,differences from C,applications in the field of electronic information); 2.Development environment construction (VS Code / CLion configuration,engineering creation); the basic structure of the program (header file,main function,namespace); 4.Basic data type and bit operation (electronic information core). Module 2: Process control and basic algorithm 1.Branch control (if-else,switch-case,adaptive sensor threshold judgment); 2.Cyclic control (for,while,adapt to continuous data acquisition); 3.Jump statement (break,continue); 4.Simple algorithm implementation (data sorting,filtering). Module 3: Arrays,Strings and Functions 1.one-dimensional / two-dimensional array (signal sequence storage); 2.C style string and string class (serial data parsing); 3.Function definition,declaration and parameter transfer (value transfer,address transfer); 4.Function overload and default parameters. Module 4: Pointer,Reference and Dynamic Memory 1.Pointer concept and operation (memory addressing); 2.Pointers and arrays / strings (efficient data access); 3.Applications in references and function parameters; 4.Dynamic memory allocation (new / delete) and memory leak prevention. Module 5: Object-Oriented Programming (OOP) 1.OOP core idea (encapsulation); 2.Class and object definition,access control (public / private); 3.Constructor and destructor (hardware module</p>

	<p>resource management); 4.Hardware module packaging practice; 5.Inheritance (base class and derived class,sensor class code reuse); 6.Polymorphism (virtual function,hardware unified interface).</p> <p>Part B Practice teaching (16 face-to-face teaching)</p> <p>Experiment 1: C + + environment and basic program 1.Build the development environment,compile the first C + + program; 2.Implement variable definition,input and output,simple bit operation (analog hardware register operation).</p> <p>Experiment 2: Process control and data processing 1.Write a branch program to determine the sensor data threshold; 2.Realize the loop program to collect and display the simulation data; 3.Complete simple data filtering.</p> <p>Experiment 3: Array,String and Function Practice 1.Storing and traversing the sensor signal sequence with an array; 2.Use string class to parse serial format string; 3.Packaging data processing functions to achieve parameter transfer.</p> <p>Experiment 4: Pointer,Reference and Dynamic Memory 1.Realizing array data sorting with pointers; 2.Optimize data access with reference; 3.Dynamic allocation of memory storage variable length acquisition data and secure release.</p> <p>Experiment 5: Class encapsulation of hardware modules 1.Define the LED control class (package switch,brightness adjustment function); 2.Define the temperature sensor class (encapsulated data reading,calibration function); 3.Create objects and invoke module functions.</p> <p>Experiment 6: OOP synthesis and hardware simulation 1.Implement the general sensor base class,and derive the humidity / pressure sensor subclass (inheritance); 2.Using polymorphism to realize the unified call of different sensors; 3.Simulate multi-hardware module collaborative control and add exception handling.</p>
Examination forms	The closed-book written examination method is adopted.
Study and examination Requirements	<p>1.Formative evaluation (40 %)</p> <p>Homework and self-study tasks (15 %): homework after class,covering core knowledge points,scoring according to code correctness,standardization,and professional application suitability; experimental report and performance (20 %): 6 experimental reports (including code,running results,error analysis),according to the task completion,debugging ability,report normative score; classroom participation and attendance (5 %): based on interactive Q & A,group discussion performance and attendance records.</p> <p>2.Final evaluations (60 per cent)</p> <p>Final examination (60 %): closed-book written examination,including multiple choice questions,code reading questions,programming questions; focus on core knowledge and professional application ability,covering the whole module content.</p>
Reading list	<p>1.Required books [1]Qian Neng.C++ Programming Tutorial (3rd Edition).Tsinghua University Press,2021. [2]Bjarne Stroustrup.C++ Programming Language (4th Edition).Pearson,2013.</p> <p>2.Reference books</p>

09 Module Descriptions

	<p>[1]C++ Primer Plus (6th Edition),Stephen Prata. [2]Embedded C++ Programming Practice,Electronic Industry Press. [3]Online resources: cppreference.com teaching-material: [1] Money can.'C + + Programming Tutorial (3rd Edition)'.Tsinghua University Press,2021. [2] Bjarne Stroustrup.' C + + programming language (4th edition)'.Pearson Press,2013. References: [1]' C + + Primer Plus (6th edition)',by Stephen Prata; [2]' Embedded C + + programming practice',Electronic Industry Press; [3] Online resources: cppreference.com.</p>
Data of last mendment	September 23,2025

Circuit Theory

Module designation	Circuit Theory
Semester(s) in which the module is taught	3th semester
Person responsible for the module	Zheng Wen
Language	Chinese
Relation to curriculum	The course "Circuit Theory" is a rigorous, logically structured discipline with broad engineering applications, serving as a core foundational course for Electrical Engineering and Automation majors. Studying this subject plays a vital role in developing students' scientific thinking and enhancing their problem-solving abilities. Through this course, students will acquire fundamental knowledge of modern circuit theory, master basic analysis and calculation methods for general circuits, and gain preliminary experimental skills, thereby laying a solid foundation for advanced studies and future engineering careers.
Teaching methods	Target students: Electrical Engineering and Automation students Type of teaching: Theoretical teaching and experimental teaching Teaching methods: Case method; Questioning method Contact hour: 80 hours Including Theoretical teaching: 64 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 70-80
Workload (incl. contact hours, self-study hours)	Total workload = 225 hours Contact hours = 80 hours Self-study hours = 145 hours
Credit points	5.0 Eucology 7.5
Required and recommended prerequisites for joining the module	Advanced Mathematics, College Physics
Module objectives/ intended learning outcomes	Learning outcomes: ● Knowledge: 1. The ability to use the language tools of mathematics, natural science

	<p>and engineering science to properly describe the complex problems of electrical engineering.</p> <p>2.It can establish the appropriate mathematical model of the electrical and electronic system,and deduce,solve and analyze the complex problems,and get the meaningful results.</p> <p>● Skill:</p> <p>1.Based on scientific principles and scientific methods,the research route and feasible experimental scheme can be selected for electrical and electronic devices,circuits,devices and complex electrical engineering systems.</p> <p>2.The ability to correctly select experimental devices,equipment,or apparatus,set up experimental systems,conduct scientific experiments safely,and obtain experimental data.</p> <p>● Competence:</p> <p>1.It can correctly screen and process the experimental data,draw reasonable and effective conclusions through comprehensive information analysis,and improve the solution of complex electrical engineering problems.</p>
Content	<p>A.Theoretical teaching(64 contact hours; 145 self-study hours)</p> <p>Chapter 1 Circuit model and Circuit law (6 contact hours; 14 self-study hours)</p> <ul style="list-style-type: none"> ● Circuit and Circuit Model ● Current and Voltage Reference Directions ● Electrical Power and Energy ● Circuit Element ● Voltage Source and Current Source ● Controlled Source ● Kirchhoff Law <p>Chapter 2 Basic Analysis of Resistance Circuit (16 contact hours; 36 self-study hours)</p> <ul style="list-style-type: none"> ● Equivalent Transformation of Circuits ● Equivalent Transformation of Resistance ● Equivalent Transformation of Voltage Source and Current Source ● General Analysis of Resistor Circuits <p>Chapter 3 Analysis of Dynamic Circuits(12 contact hours; 27 self-study hours)</p> <ul style="list-style-type: none"> ● Energy Storage Element ● Equations and Initial Conditions of Dynamic Circuits ● Response Analysis of First-order Circuit ● Definition and Basic Properties of Laplace Transform; The Inverse Laplace Transform is Obtained by the Partial Fraction Method. ● Operation Circuit ; the Analysis of Linear Circuit by Laplace Transform Method <p>Chapter 4 Analysis of AC Steady State Circuit(30 contact hours; 68 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Concepts and Three Elements of Sinusoidal Alternating

	<p>Quantities ; Fundamentals of Phasor Analysis for Sinusoidal Quantities; Phasor form of Circuit Laws</p> <ul style="list-style-type: none"> ● Impedance and Admittance; Phasor Diagram of Circuits ● Analysis of Sinusoidal Steady-state Circuits; Power and Maximum Power Transfer in Sinusoidal AC Circuits ● Mutual inductance ; Analysis and Calculation of Circuits with Mutual Inductance; Power of Coupled Inductors ● Principle of transformer; Ideal transformer ● Frequency response of circuits ● Symmetrical Three-phase Voltage and Current ; Relationship between Line Voltage and Phase Voltage,Line Current and Phase Current in Symmetrical Three-phase Circuits ; Calculation of Symmetrical three-phase Circuits ; Concept and Calculation of Unsymmetrical three-phase Circuits ; Calculation and Measurement of three-phase Power ● Non-sinusoidal Periodic Signal; Decomposition of Periodic Signals into Fourier Series; Effective Value , Average Value and Average Power; Calculation of Non-sinusoidal Periodic Current Circuits ● Matrix Equations and Parameters of Two-port Networks ; Equivalent Circuit of Two-port Networks <p>Part B.Experiment teaching(16 contact hours)</p> <p>In order to help students better understand the principles of data mining, master data mining or machine learning methods, and improve practical skills, we will arrange the following 8 typical experimental courses:</p> <p>Experiment 1: Study on Superposition and Homogeneity of Linear Circuit(2 contact hours)</p> <p>Experiment 2: Davine's Theorem-Determination of Equivalent Parameters of Active Two-terminal Networks(2contact hours)</p> <p>Experiment 3: Study on Transient Process of First Order Circuit(2 contact hours)</p> <p>Experiment 4: Research on AC Series Circuit(2 contact hours)</p> <p>Experiment 5:The Circuit of Fluorescent Lamp and the Improvement of Power Factor (2 contact hours)</p> <p>Experiment 6:Measurement of Voltage and Current in Three-phase Circuit(2 contact hours)</p> <p>Experiment 7: Design and Implementation of Phase Sequence Indicator Circuit(2 contact hours)</p> <p>Experiment 8: Determination of Frequency Characteristics of AC Circuits(2 contact hours)</p>
Examination forms	Closed-book written exam
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students should independently complete the homework after each class. Being late, leaving early, or unapproved absence is not allowed. ● Regular grade accounts for 20%, including homework and periodic assessments.

09 Module Descriptions

	<ul style="list-style-type: none"> ● Experimental grade accounts for 20%. ● Final assessment (closed- book written exam) accounts for 60%.
<p>Reading list</p>	<p>1.Required books [1] Qiu Guanyuan,ed.Circuits (5th ed.).Beijing: Higher Education Press,2012.(in Chinese)</p> <p>2.Reference books [1] Zhang Jianhong,He Lin (Ed.).Circuit Experiment and Computer Simulation (1st ed.).Beijing: China Electric Power Press,2018.[2] Li Hansun (Ed.).Fundamentals of Circuit Analysis (4th ed.).Beijing: Higher Education Press,2012.[3] Liu Chongxin,Luo Xianjue (Ed.).Circuit (5th ed.).Learning Guide and Exercise Analysis.Beijing: Higher Education Press,2012.[4] Li,Hansun (Chief Editor).Study Guide for Basic Circuit Analysis (4th Edition).Beijing: Higher Education Press,2012.</p>
<p>Data of last mendment</p>	<p>June 29,2025</p>

Analog Electronic Technology

Module designation	Analog Electronic Technology
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Li Yu
Language	Chinese
Relation to curriculum	<p>The course Analog Electronics is an introductory engineering foundation course in electronic technology for the major of Electrical Engineering and Automation. Its mission is to enable students to master the performance of common semiconductor devices and the functions of typical analog electronic unit circuits through the study of this course, analyze the functions of system circuits composed of unit circuits, acquire the basic theories, knowledge and skills in analog electronics, cultivate the ability to analyze and solve problems, and lay a solid foundation for the follow-up courses of the major and the application of electronic technology in the major.</p> <p>The main contents of this course include: common semiconductor devices, basic amplifier circuits, multistage amplifier circuits, integrated operational amplifier circuits, feedback in amplifier circuits, signal operation and processing, waveform generation and signal conversion, power amplifier circuits, DC power supplies, and reading of analog electronic circuit diagrams, etc.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students Type of teaching: Theoretical teaching and experimental teaching Teaching methods: Case method; Questioning method Contact hour: 56 hours Including Theoretical teaching: 46 hours Experiment teaching: 10 hours Computer practice: 0 hours Size of class: 80-90</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 150 hours Contact hours = 56 hours Self-study hours = 94 hours</p>
Credit points	3.5 European credits 5

<p>Required and recommended prerequisites for joining the module</p>	<p>Higher Mathematics, Circuit Theory</p>
<p>Module objectives/ intended learning outcomes</p>	<p>Course Objectives and Competencies to Be Achieved Through This Course:</p> <p>1.Be able to analyze the performance and parameters of semiconductor devices by applying the structure and principle of PN junctions; analyze the technical indicators of amplifiers using static operating point estimation,graphical analysis,and small-signal equivalent circuit analysis; cascade amplifier circuits through different coupling methods of amplifiers; and comprehensively process electrical signals using integrated operational amplifiers.</p> <p>2.Be able to correctly identify feedback in circuits and introduce appropriate feedback into amplifier circuits as needed; analyze the characteristics of power amplifier circuits based on their composition principles; and estimate parameters and design simple power supply circuits using the working principle of DC regulated power supplies.</p> <p>3.Be able to conduct relevant theoretical reviews for analog circuit experiments using scientific methods,select research approaches,and design feasible experimental schemes.</p> <p>4.Be able to use experimental instruments and meters correctly and standardizedly,select experimental devices to construct experimental systems,conduct scientific experiments safely,and obtain experimental data.</p> <p>5.Be able to correctly screen and process experimental data,write experimental reports in a standardized manner,draw reasonable and effective conclusions through comprehensive information analysis,and improve solutions to circuit problems.</p>
<p>Content</p>	<p>A.Theoretical teaching(46contact hours; 94 self-study hours)</p> <p>Chapter 1 Common Semiconductor Devices (8contact hours, 16 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Knowledge of Semiconductors; ● Semiconductor Diode; ● Crystal Triode; ● Field Effect Transistor; ● Components in Integrated Circuits <p>Chapter 2 Basic Amplifier Circuits (6 contact hours, 12 self-study hours)</p> <ul style="list-style-type: none"> ● Concept of Amplification and Main Performance Indicators of Amplifier Circuits; ● Operating Principle of Basic Common-emitter Amplifier Circuit;

	<ul style="list-style-type: none"> ● Analysis Methods of Amplifier Circuits; ● Stability of the DC Operating Point of Amplifier Circuits; ● Three Basic Configurations of Single-transistor Amplifier Circuits; <p>Chapter 3 Integrated Operational Amplifier Circuits (6 contact hours, 12 self-study hours)</p> <ul style="list-style-type: none"> ● General Problems of Multistage Amplifier Circuits; ● Overview of Integrated Operational Amplifier Circuits; ● Unit Circuits in Operational Amplifiers; ● Brief Introduction to Operational Amplifier Circuits <p>Chapter 4 Feedback in Amplifier Circuits (6 contact hours, 12 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Concept and Judgment Method of Feedback; ● Four Basic Configurations of Negative Feedback Amplifier Circuits; ● Block Diagram and General Expression of Negative Feedback Amplifier Circuits; ● Analysis of Amplification Factor of Deep Negative Feedback Amplifier Circuits; ● Effect of Negative Feedback on the Performance of Amplifier Circuits <p>Chapter 5 Signal Operation and Processing (6 contact hours, 12 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Operational Circuits ● Analog Multiplier and its Application in Operational Circuits ● Active Filter Circuits <p>Chapter 6 Waveform Generation and Signal Conversion (4 contact hours, 8 self-study hours)</p> <ul style="list-style-type: none"> ● Sinusoidal Oscillation Circuit; ● Voltage Comparator; ● Non-sinusoidal Wave Generation Circuit <p>Chapter 7 Power Amplifier Circuits (4 contact hours, 8 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of power amplifier circuits ● Complementary power amplifier circuits ● Safe operation of power amplifier circuits <p>Chapter 8 DC Power Supplies (6 contact hours, 12 self-study hours)</p> <ul style="list-style-type: none"> ● Composition of a DC power supply and functions of each part ● Rectifier circuit ● Filter circuit ● Zener diode voltage regulator circuit ● Series voltage regulator circuit ● Switching voltage regulator circuit <p>Part B. Experiment teaching (10 contact hours)</p> <p>To help students better review relevant theories of analog circuit experiments by scientific methods, select research routes, design feasible experimental schemes, use experimental instruments and meters correctly and standardly, screen and process experimental data properly, write experimental reports in a standardized manner, and improve solutions to circuit problems, we will arrange the following five typical experimental projects:</p>
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09 Module Descriptions

	<p>Experiment 1: Use of Common Instruments (2 contact hours)</p> <p>Experiment 2: Single-Stage Amplifier Circuit (2 contact hours)</p> <p>Experiment 3: Negative Feedback Amplifier Circuit (2 contact hours)</p> <p>Experiment 4: Proportional Summing Operational Circuit (2 contact hours)</p> <p>Experiment 5: Waveform Generation Circuit (2 contact hours)</p>
Examination forms	Closed-book written exam
Study and xamination Requirements	<ul style="list-style-type: none"> ●Students are required to complete the homework after each class independently. Being late, leaving early or unapproved absence is not allowed. ●The regular grade is evaluated as 40%, including homework (16%), experiments (20%) and periodic assessments (4%). Regular grade accounts for 40%, and the final assessment (closed-book written exam) accounts for 60%.
Reading list	<p>Recommended Textbooks and Reference Books</p> <p>[1] Tong Shibai, Hua Chengying (Eds.). Fundamentals of Analog Electronic Technology. Beijing: Higher Education Press, July 2015. (in Chinese)</p> <p>[2] Kang Huaguang, Zhang Lin (Eds.). Fundamentals of Electronic Technology (Analog Section). Beijing: Higher Education Press, June 2021. (in Chinese)</p> <p>[3] Wang Zhongxun, Sun Yuanping (Eds.). Fundamentals of Analog Electronic Technology. Xi'an: Xidian University Press, August 2017. (in Chinese)</p> <p>[4] Wen Changze (Ed.). Experiments on Fundamentals of Electronic Technology. Beijing: Chemical Industry Press, May 2021. (in Chinese)</p>
Data of last mendment	December 20, 2025

Digital Electronic Technology

Module designation	Digital Electronic Technology
Semester(s) in which the module is taught	5th semester
Person responsible for the module	ZHang Jinghui
Language	Chinese
Relation to curriculum	Digital Electronic Technology is a fundamental course in the field of Electrical Engineering and Automation, which combines theory and practice closely.
Teaching methods	<p>Target students: Electrical Engineering and Automation major students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 48 hours Including</p> <p>Theoretical teaching: 40 hours</p> <p>Experiment teaching: 8 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 110-130</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 48 hours</p> <p>Contact hours = 48 hours</p> <p>Self-study hours = 72 hours</p>
Credit points	3.0 European credits 4
Required and recommended prerequisites for joining the module	Circuit Theory, Analog Electronic Technology
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Understand the basic knowledge of logical algebra 2. Master the analysis and design process of logic circuits, as well as the logic functions of commonly used devices. ● Skill:

	<p>1. Being able to correctly select and use integrated components,2.Use data mining tools to try to solve real problems.</p> <p>2. Establish scientific and systematic analysis methods for digital logic circuits,cultivate the ability to analyze and solve problems。</p> <p>● Competence:</p> <p>Cultivate hands-on skills,knowledge application abilities,and design creativity New abilities and the flexible application of theoretical knowledge of digital electronic technology to practice play a very important role in cultivating electrical and electronic technology talents.</p>
Content	<p>A.Theoretical teaching(40 contact hours; 72 self-study hours)</p> <p>Chapter 1 Code system and number system (2contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Common number systems; ● Conversion between different number systems; ● Binary arithmetic operations; ● Several common codes <p>Chapter 2 Fundamentals of Logical Algebra (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Basic operations of Boolean algebra; ● Basic and commonly used formulas of Boolean algebra; ● Basic theorems of Boolean algebra; ● Logic functions and their representation methods; ● Simplification methods of logic functions <p>Chapter 3 Gate Circuit (2 contact hours; 3 self-study hours)</p> <ul style="list-style-type: none"> ●Semiconductor diode gate circuits; ●CMOS gate circuits <p>Chapter 4Image Gray-level Transformation and Spatial Filtering (10 contact hours ; 18 self-study hours)</p> <ul style="list-style-type: none"> ●Analysis and design of combinational logic circuits; ●Several commonly used combinational logic circuits <p>Chapter 5 Toggle flip-flop(6 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ●SR Latch ●Level-triggered flip-flop; ●Pulse-triggered flip-flop; ●Edge-triggered flip-flop; ●Logic function of flip-flops and their description methods <p>Chapter 6 Sequential logic circuit (10 contact hours; 18 self-study hours)</p> <ul style="list-style-type: none"> ●Analysis methods of sequential logic circuits; ●Several commonly used sequential logic circuits; ●Design methods of sequential logic circuits <p>Chapter 10 Generation and Shaping of Pulse Waveforms (4 contact hours; 7 self-study hours)</p> <ul style="list-style-type: none"> ●Schmitt trigger; ●Monostable circuit; ●Astable multivibrator; ●Principle and application of 555 timer circuit

	<p>Chapter 11 Digital to analog and analog-to-digital conversion (2contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●A/D converter ●D/A converter <p>Part B.Experiment teaching(8 contact hours)</p> <p>In order to help students better understand the principles of logical algebra, master the analysis methods of logical circuits, and improve practical skills, we will arrange the following four typical experimental projects:</p> <p>Experiment 1: Functional testing of combinational logic circuits (2 class hours)</p> <p>Experiment 2: Encoder and Decoder Function Test (2 class hours)</p> <p>Experiment 3: Trigger Function Test and Application (2 class hours)</p> <p>Experiment 4: Counting, Decoding, and Display Circuit (2 class hours)</p>
Examination forms	Closed-book written exam
Study and examination Requirements	<p>Students should independently complete homework after each class. Late arrivals, early departures, or unauthorized absences are not allowed.</p> <p>The evaluation standard for regular grades is 40%, including homework (20%) and experiments (20%). Regular grades account for 40%, and final exams (closed book written exams) account for 60%.</p>
Reading list	<p>1.Required books</p> <p>[1] Yan Shi Fundamentals of Digital Electronic Technology Sixth edition Higher Education Press, 2020</p> <p>[2] Kang Huaguang Fundamentals of Electronic Technology (Digital Section) Higher Education Press, 2018</p> <p>[3] Fundamentals of Electronic Technology: Digital Part. Teacher's Manual [M]. Beijing: Higher Education Press, 2019.</p> <p>2.Reference books</p> <p>[1] Electronic Technology Fundamentals Digital Part (Part 4) Teacher's Handbook Higher Education Press, 2019</p>
Data of last mendment	June 29, 2025

Signal Analysis and Processing

Module designation	Signal Analysis and Processing
Semester(s) in which the module is taught	4th Semester
Person responsible for the module	Lv Xiaoli
Language	Chinese
Relation to curriculum	"Signal Analysis and Processing" is an engineering foundational course in the Electrical Engineering and Automation major, and it is a compulsory course for electrical and information-related disciplines. This course systematically elaborates on the fundamental concepts, principles, techniques, and methods of signal analysis and processing. Centered around signal analysis, system analysis, and signal processing, it covers different analytical methods for signals and systems in the time domain, frequency domain, and complex frequency domain, while introducing the design methods of digital filters, among other topics. The course emphasizes cultivating students' abilities to apply signal processing and analytical methods for analyzing and solving problems in simple practical application systems, thereby fostering their engineering mindset.
Teaching methods	Teacher-centered approach; Lecture method; Questioning method; Discussion method; Computer demonstration
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 24 hours
Credit points	2.0 European credits 2.0
Required and recommended prerequisites for joining the module	Complex Functions Circuit Theory
Module objectives/ intended learning outcomes	<p>Learning outcomes</p> <p>Knowledge:</p> <ol style="list-style-type: none"> 1. Master the fundamental concepts, classifications, and basic transform theories of signals and systems. 2. Master the mathematical models and description methods for Linear Time-Invariant (LTI) systems in the time domain, frequency domain (Fourier analysis), and complex frequency domain (Laplace transform/Z-transform). 3. Master the core analytical methods for continuous-time and discrete-time signals, as well as the principles for analyzing system characteristics (such as filtering, modulation, and spectrum).

	<p>4. Master the basic types, characteristics, and classical design methods of digital filters.</p> <p>Skills:</p> <ol style="list-style-type: none"> 1. Be able to appropriately model and describe engineering problems related to signal processing using mathematical tools and signal & system theories. 2. Be able to select and apply time-domain, frequency-domain, or complex frequency-domain methods to establish mathematical models for LTI systems and perform effective analysis and processing based on requirements. 3. Be able to analyze simple practical application systems and propose preliminary signal processing solutions by applying fundamental principles of signal processing. <p>Abilities:</p> <ol style="list-style-type: none"> 1. Possess the ability to analyze and interpret the time-domain and frequency-domain characteristics of signals. 2. Possess the fundamental ability to model, analyze, and design (e.g., filter design) LTI systems. 3. Initially develop the thinking methodology and engineering awareness for applying signal processing theory to solve practical engineering problems.
Content	<p>A. Theoretical teaching (32 contact hours; 28 self-study hours)</p> <p>Chapter 1 Introduction to Signal and System Analysis (2 contact hours; 2 self-study hours)</p> <ol style="list-style-type: none"> (1) Description and Classification of Signals (2) Description and Classification of Systems (3) Overview of Signal and System Analysis <p>Chapter 2 Time-Domain Analysis of Signals and Systems (8 contact hours; 6 self-study hours)</p> <ol style="list-style-type: none"> (1) Basic Signals (2) Fundamental Operations on Signals (3) Mathematical Models of LTI Systems (4) Impulse Response of LTI Continuous-Time Systems (5) Convolution Integral (6) Convolution Sum <p>Chapter 3 Frequency-Domain Analysis of Signals and Systems (10 contact hours; 8 self-study hours)</p> <ol style="list-style-type: none"> (1) Frequency-Domain Analysis of Periodic Signals (2) Frequency-Domain Analysis of Aperiodic Signals (3) Frequency-Domain Analysis of Discrete Signals

	<p>(4) Time-Domain Sampling of Signals, Frequency-Domain Analysis of Systems</p> <p>Chapter 4 Complex Frequency-Domain Analysis of Signals and Systems (6 contact hours; 6 self-study hours)</p> <p>(1) Definition of the Complex Frequency Domain</p> <p>(2) Complex Frequency-Domain Analysis of LTI Systems</p> <p>(3) System Function and System Characteristics of LTI Systems</p> <p>Chapter 5 Digital Filter Design (6 contact hours; 6 self-study hours)</p> <p>(1) Basic Concepts of Digital Filters</p> <p>(2) Analog Filter Design</p> <p>(3) Impulse Invariance Method</p>
Examination forms	Using a closed-book written examination method
Study and examination Requirements	<p>I. Learning Discipline</p> <p>To ensure the course learning effect and cultivate students' rigorous and punctual study style, the following classroom and experimental discipline requirements are formulated:</p> <p>(1) Classroom Discipline: Students should attend classes on time and must not be late or leave early. Absence due to special reasons must be requested in advance and approved in accordance with school regulations; otherwise, it will be treated as unexcused absence.</p> <p>(2) Homework Requirements: Students should independently and timely complete and submit the homework assigned for each chapter. Homework should be neatly written, with clear steps and accurate calculations. Plagiarized or identical homework will be given a zero score.</p> <p>(3) Experiment Requirements: Students must carefully preview the experiment and complete the preview report before the experiment; during the experiment, they must strictly abide by the laboratory rules and regulations and complete the experimental operations, data recording, and analysis independently or as required by the group; after the experiment, they must submit a standardized experimental report on time.</p> <p>(4) Academic Integrity: In homework, and examinations, students must uphold academic integrity and refrain from any form of cheating or plagiarism. Violators will be dealt with seriously in accordance with school regulations.</p> <p>II. Assessment Methods and Grade Composition</p> <p>This course adopts a combination of formative assessment and summative assessment. The final grade consists of two parts: regular performance and final examination results, with the following proportions:</p>

	<p>(1) Regular Performance: 40% of the final grade,including homework and quizzes,etc.It assesses students' understanding,mastery,and application ability of the knowledge points in each chapter.</p> <p>(2) Final Examination (Closed-book Written Examination): 60% of the final grade.The examination comprehensively covers all theoretical chapters of the course,focusing on assessing students' ability to understand basic concepts,core principles,analysis and calculation,and comprehensive application.The question types may include multiple-choice questions,fill-in-the-blank questions,short-answer questions,analysis and calculation questions,and comprehensive design questions.</p>
Reading list	<p>Required books</p> <p>[1] Cheng Peiqing,Digital Signal Processing Tutorial (5th Edition),Tsinghua University Press,2017.</p> <p>[2] Gao Xiquan,Ding Yumei,Digital Signal Processing (5th Edition),Xidian University Press,2022.</p> <p>[3] Chen Houjin,Digital Signal Processing (4th Edition),Higher Education Press,2024.</p> <p>Main References</p> <p>[1] Oppenheim,A.V.,et al.,Discrete-Time Signal Processing (3rd Edition),translated by Liu Shutang,Publishing House of Electronics Industry,2015.</p> <p>[2] Chen Houjin (Ed.).Signals and Systems (4nd ed.).Beijing: Higher Education Press.2024.</p> <p>[3] Chen Houjin (Ed.).Digital Signal Processing (4nd ed.).Beijing: Higher Education Press.2025.</p> <p>[4] Gao Xiquan & Ding Yumei (Eds.).Digital Signal Processing (5th ed.).Xi'an: Xidian University Press.2023.</p> <p>[5]Xu,Kejun,et al.Signal Analysis and Processing.(3rd ed.),Tsinghua University Press,2022.</p>
Data of last mendment	June 29,2025

Introduction To Electrical Engineering

Module designation	Introduction To Electrical Engineering
Semester(s) in which the module is taught	3th semester
Person responsible for the module	Huida duan
Language	Chinese
Relation to curriculum	<p>"Introduction to Electrical Engineering" serves as a foundational course for Electrical Engineering and Automation majors. The curriculum covers power generation systems, transmission and distribution networks, electrical equipment, and power system protection and control. Through this course, students will gain insights into the production processes, characteristics, and environmental impacts of energy conversion into electrical energy. They will also acquire fundamental knowledge of power systems, electrical equipment, primary systems, and power system protection and control. Additionally, the course helps students identify their future academic and professional career paths, understand the nature and responsibilities of their technical roles, and stay informed about emerging technologies, equipment, and principles in the global power industry.</p>
Teaching methods	<p>Target Students: Electrical Engineering and Automation majors. Teaching Type: Theoretical instruction. Teaching methods: Case method; Questioning method Total Hours: 60 (24 hours for theoretical teaching, 36 hours for self-study). Class Size: 80-120 students.</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 60 hours Contact hours = 24 hours Self-study hours = 36 hours</p>
Credit points	2, European credits 2
Required and recommended prerequisites for joining the module	Advanced Mathematics, University Physics
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. Master the fundamental components of the entire energy production</p>

	<p>and consumption cycle,including power generation,transmission,transformation,distribution,and consumption.</p> <p>2.Proficient in fundamental knowledge of power systems,electrical equipment,primary systems,and power system protection and control.</p> <p>● Skill:</p> <p>1.Able to apply the basic knowledge of power systems and the working principles of electrical equipment to reasonably analyze the structure of power networks and the operational modes of systems.</p> <p>2.Able to apply the fundamental principles of electrical primary systems and relay protection to analyze the performance and characteristics of electrical equipment and systems.</p> <p>● Competence:</p> <p>The training aims to cultivate students' professional cognition and knowledge integration ability,engineering thinking and problem analysis ability,engineering application ability,professional quality and comprehensive development ability.</p>
Content	<p>Chapter 1 Overview (2 class hours; 4 self-study hours) Overview of Electric Power Industry Development energy development strategy</p> <p>Chapter 2 Thermal Power Generation (2 class hours; 4 self-study hours) production process of thermal power plant boiler unit steam turbine equipment The Impact of Thermal Power Plant on Environment and the Countermeasures</p> <p>Chapter 3 Hydroelectric Power (2 class hours; 2 self-study hours) Distribution of hydropower resources in China The Production Process and Types of Hydropower Stations in China,Main Power Equipment of Hydropower Stations Characteristics of Hydroelectric Power Generation</p> <p>Chapter 4 Nuclear Power Generation (2 class hours; 4 self-study hours) Development of Nuclear Power in China, Process of Pressurized Water Reactor Nuclear Power Plant Environmental Impact of Nuclear Power Plant</p> <p>Chapter 5: New Energy Power Generation (2 class hours; 6 self-study hours) solar electrical energy generation wind power generation Other forms of new energy generation The Relationship between New Energy Power Generation and Environmental Sustainable Development</p> <p>Chapter 6: Fundamentals of Power Systems (6 class hours; 6 self-study hours) Basic components of power system Wiring and Voltage Levels of Power Networks</p>

09 Module Descriptions

	<p>load of power system power quality index Operation Mode of Neutral Point in Power System Chapter 7: Introduction to Electrical Equipment in Primary System of Power Plant and Substation (4 class hours; 6 self-study hours) Introduction to Electrical Equipment Introduction to Main Wiring Chapter 8:Relay Protection and Automatic Devices (2 class hours; 4 self-study hours) Basic Knowledge of Relay Protection Introduction to Automatic Equipment of Power System</p>
Examination forms	Closed-book written exam
Study and xamination Requirements	<ul style="list-style-type: none"> ●Students must independently complete the assignments after each class.Late arrivals,early departures,or unauthorized absences are not permitted. ●Regular performance accounts for 20%,including four assignments; the final assessment (closed-book written test) accounts for 80%.
Reading list	<p>1.Required books [1] Xiong Xinyin,ed.,Zhang Buhan.Fundamentals of Electrical Engineering.Wuhan: Huazhong University of Science and Technology Press,2010 [2] Wei Gang et al.Introduction to Power Engineering.Beijing: China Electric Power Press.November 2009</p> <p>2.Reference books [1] Shan Hongtao,Chen Bei,Li Xue.Fundamentals of Electrical Engineering [M].Beijing: China Railway Publishing House,2020. [2] GB/T 14549-2011,Power Quality-Harmonics in Public Power Networks [S].2011. [3] National Energy Administration.New Power System Development Blue Paper (2023) [R].Beijing: National Energy Administration,2023. [4] State Grid Corporation of China.Smart Grid Technical Standards System (2024 Edition) [S].Beijing: State Grid Corporation of China,2024.</p>
Data of last mendment	January 11,2022

Theory of Electrical Machine

Module designation	Theory of Electrical Machine
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Zhou Shan
Language	Chinese
Relation to curriculum	<p>The course in Electrical Machinery constitutes a core foundational subject within the Electrical Engineering and Automation programme, laying the groundwork for students' subsequent specialised studies and future professional practice. Through this course, students will acquire fundamental theoretical knowledge concerning the structure, operating principles, analytical methodologies, characteristics, and operational modes of four principal types of electric motors within the electrical engineering domain. Through practical case studies and fundamental experimental training, students develop foundational engineering thinking, acquire the ability to assess and evaluate motor operational states, and gain skills to resolve motor-related operational issues. The course cultivates students as successors to socialism with professional competence, an international outlook, national consciousness, and a sense of responsibility, nurtured across three dimensions: institutional confidence, professional ethics, and scientific spirit.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 64 hours Including</p> <p>Theoretical teaching: 60 hours</p> <p>Experiment teaching: 4 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 180 hours</p> <p>Contact hours = 64 hours</p> <p>Self-study hours = 116 hours</p>
Credit points	4.0 European credits 6.0

<p>Required and recommended prerequisites for joining the module</p>	<p>Advanced Mathematics, University Physics, Electric Circuit Theory</p>
<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Systematically master the fundamental structure, operating principles, and performance characteristics of the four major categories of electric motors: DC motors, transformers, induction motors, and synchronous motors. 2. Be capable of establishing equivalent models for various types of motors and comprehend the practical requirements of engineering calculations. ● Skill: <ol style="list-style-type: none"> 1. Possess the ability to establish and simplify equivalent circuits and mathematical models for electric motors, and perform relevant engineering calculations. 2. Master the standardised operation, data acquisition, and fundamental analytical skills required for fundamental motor experiments. ● Competence: <ol style="list-style-type: none"> 1. Possess the ability to analyse and assess the operational status and performance variations of electric motors using theoretical knowledge, and propose preliminary solutions. 2. Demonstrate an initial capacity to integrate theoretical principles, models and practical methodologies to resolve engineering issues pertaining to electric motors.
<p>Content</p>	<p>A. Theoretical teaching (60 contact hours; 116 self-study hours)</p> <p>Chapter 1 General Discussion (2 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Functions, classification of electric motors, and connection of static and dynamic circuits; ● Basic physical quantities and fundamental laws of magnetic field; ● Magnetic properties of ferromagnetic materials <p>Chapter 2 DC motor (10 contact hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ● Basic structure and operating principle of DC motors; ● Basic analysis methods of DC motors (air-gap magnetic field and armature reaction, brush electromotive force and electromagnetic torque, voltage equation); ● Basic characteristics of DC motors (external characteristics of DC generators, mechanical characteristics of DC motors, and starting, speed regulation, braking, commutation problems) <p>Chapter 3 Transformer</p>

	<p>(16 contact hours; 32 self-study hours)</p> <ul style="list-style-type: none"> ● Basic structure and operating principle of transformers (electromagnetic relationships, voltage transformation relationships, and magnetomotive force balance equation under no-load and on-load operation); ● Basic analysis methods of transformers (basic equations, equivalent circuits, phasor diagrams, parameter measurement and calculation); ● Basic characteristics of transformers (external characteristics, voltage regulation, waveform quality, dotted terminals, connection groups, efficiency characteristics); ● Parallel operation of transformers (requirements, conditions, load distribution); ● Special-structured transformers (three-winding transformers, autotransformers) <p>Chapter 4 Induction motor (14 contact hours; 26 self-study hours)</p> <ul style="list-style-type: none"> ● Basic structure and operating principle of induction motors; ● Theory of rotating magnetic field and equivalent circuit of induction motors; ● Basic characteristics of induction motors (power balance equation, torque equation, mechanical characteristics); ● Starting and speed regulation of induction motors. <p>Chapter 5 Synchronous motor (18 contact hours; 34 self-study hours)</p> <ul style="list-style-type: none"> ● Basic structure, operating principle and armature reaction of synchronous motors; ● Basic analysis methods of synchronous motors (electromagnetic relationships, voltage equations, phasor diagrams, parameter measurement); ● Basic characteristics and parallel operation of synchronous machines (external characteristics, regulation characteristics, modes and conditions of parallel operation, power-angle characteristics, V-curves); ● Sudden short circuit of synchronous machines <p>Part B. Experiment teaching (4 contact hours)</p> <p>To assist students in gaining a deeper understanding of the fundamental principles of electrical machinery, mastering core methods for motor modelling and analysis, and enhancing their engineering practice and application capabilities, we shall arrange the following two typical experimental projects:</p> <p>Experiment 1: Determination of Parameters and Operating Characteristics of Single-Phase Transformers (2 contact hours)</p> <p>Experiment 2: Parallel Operation of Three-Phase Synchronous Generators (2 contact hours)</p>
Examination forms	Closed-book written exam

Study and Examination Requirements	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class. Late arrivals, early departures, or unauthorized absences are not permitted. ● The assessment criteria for regular performance account for 30% of the overall mark, comprising coursework (10%), practical work (10%), and periodic assessments (10%). ● Regular coursework accounts for 30%, while the final assessment (closed-book written examination) accounts for 70%.
Reading list	<p>1. Required books</p> <p>[1] Lin Mingyao. Electrical Machinery [M]. Beijing: China Machine Press, 2017.</p> <p>[2] Xu Zheng. Electrical Machinery Experiments [M]. Beijing: China Electric Power Press, 2016.</p> <p>2. Reference books</p> <p>[1] Li Fahai, Zhu Dongqi. Electrical Machinery [M]. Beijing: Science Press, 2013.</p> <p>[2] Hu Qiansheng, Hu Minqiang. Electrical Machinery [M]. Beijing: Higher Education Press, 2009.</p> <p>[3] Hu Qiansheng. Electromechanics Exercise Solutions [M]. Beijing: China Electric Power Press, 2006.</p> <p>[4] General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, Standardisation Administration of China. GB 1094.1-2013 Power Transformers – Part 1: General Requirements [S]. Beijing: China Planning Press, 2013.</p> <p>[5] General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, Standardisation Administration of China. GB/T 17468-2008 Selection Guidelines for Power Transformers [S]. Beijing: China Planning Press, 2008.</p> <p>[6] General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China, Standardisation Administration of China. GB/T 7064-2008 Technical Requirements for Hidden-Pole Synchronous Generators [S]. Beijing: China Planning Press, 2008.</p> <p>[7] Ministry of Water Resources of the People's Republic of China. SL 321-2005 Basic Technical Conditions for Medium and Large Hydraulic Turbine Generators [S]. Beijing: China Planning Press, 2005.</p>
Data of last amendment	June 29, 2025

Principle of Automatic Control

Module Descriptions	Principle of Automatic Control
Semester(s) in which the module is taught	6th Semester
Person responsible for the module	Zhang Yun
Language	Chinese
Relation to curriculum	<p>Principles of Automatic Control is a fundamental professional course for the major of Electrical Engineering and Automation. This course mainly introduces the basic concepts, principles, analysis and design methods of automatic control systems. The main contents include modeling of linear continuous control systems, three major analysis methods of linear systems: time-domain analysis, root-locus analysis and frequency-response analysis, design and compensation of linear systems, as well as computer-aided analysis methods for control systems.</p> <p>Through this course, students will master the basic knowledge, analysis and design methods of control theory, laying a solid theoretical foundation for the study of subsequent professional courses. It helps students develop the thinking logic of control engineering gradually, establish the scientific viewpoint of integrating theory with practice, preliminarily equip students with the ability to comprehensively analyze and solve practical engineering problems using control theory, and improve their engineering design and innovation capabilities.</p>
Teaching methods	<p>Heuristic teaching;</p> <p>Discussion-based teaching method;</p> <p>Case method;</p> <p>Problem-based learning (PBL) method,</p> <p>Analytical and reasoning method,</p> <p>Induction and summary method.</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 105 hours</p> <p>Contact hours = 40 hours</p> <p>Self-study hours = 65 hours</p>
Credit points	2.5 European credits 3.5
Required and recommended prerequisites for joining the module	Advanced Mathematics, Complex Functions, Circuit Theory
Module objectives/ intended learning outcomes	<p>Learning outcomes</p> <p>● Knowledge:</p> <p>1. Correctly understand the basic concepts of automatic control; be familiar with the composition of automatic control systems and the functions of each part; understand the classification of automatic control systems; grasp the</p>

	<p>role of feedback in automatic control systems; be able to correctly analyze the type, composition, working principle and characteristics of actual physical systems; be able to correctly draw block diagrams of systems according to their working schematics; master the basic requirements for control systems.</p> <p>2. Master the method of establishing differential equations for control systems; understand the definition and properties of transfer functions; proficiently solve transfer functions; be familiar with various typical links and their transfer functions; proficiently establish and simplify dynamic block diagrams; master Mason's gain formula for solving the closed-loop transfer function of a system.</p> <p>3. Be familiar with typical input signals and their Laplace transforms; understand the dynamic and steady-state performance indicators of systems; be familiar with the time-domain response analysis of first-order systems; proficiently grasp the relationship between the damping ratio and root distribution of the characteristic equation, as well as the unit step response of typical second-order systems; master the calculation of performance indicators for underdamped second-order systems; master the method of determining parameters of typical second-order systems according to performance requirements; understand the basic concepts, characteristics and analysis methods of high-order systems; correctly understand the concept of system stability; be familiar with the necessary and sufficient conditions for the stability of linear time-invariant systems; proficiently judge system stability and determine system parameters based on stability requirements; correctly understand the definition of steady-state error and proficiently calculate the steady-state error of a system.</p> <p>4. Understand the concept of root locus; master the rules for drawing root locus plots and proficiently draw parameter root locus plots; analyze the main performance of systems using root locus plots; qualitatively analyze the influence of adding open-loop zeros and poles on system performance.</p> <p>5. Understand the basic concept of frequency response; master the frequency characteristics of typical links; master the drawing of open-loop polar plots and Bode plots; master the application of the Nyquist stability criterion in polar plots and Bode plots; grasp the concept of relative stability and the calculation of stability margins.</p> <p>6. Understand the basic requirements, principles and design methods of system design; understand the basic concept of compensation; understand compensation methods; be familiar with basic control laws; be familiar with commonly used compensation devices and their characteristics; master the design of series compensation using the frequency-response method.</p> <p>●Skill:</p> <p>1. Be able to correctly analyze the type, composition, working principle and functions of each part for actual physical systems, further define the system flow: input → controller → control variable → controlled plant → controlled variable, and correctly draw the block diagram of the system.</p> <p>2. Be able to correctly establish time-domain and complex-domain mathematical models for actual systems, and use dynamic block diagram</p>
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	<p>simplification and Mason's formula to solve the closed-loop transfer function of the system.</p> <p>3. Proficiently calculate various performance indicators of typical underdamped second-order systems; proficiently judge the stability of actual systems, calculate the steady-state error of the system, and determine measures to reduce steady-state error.</p> <p>4. Be able to proficiently draw the system root locus according to root locus rules, and use the root locus diagram to analyze the influence of zeros and poles on the dynamic and steady-state performance of the system.</p> <p>5. Be able to proficiently draw Nyquist diagrams and Bode diagrams of the system based on the frequency characteristics of typical links; proficiently apply the Nyquist stability criterion and logarithmic frequency stability criterion to judge the stability of Type 0 systems and systems with series integral links in the open loop, and further calculate the stability margins of the system.</p> <p>6. Be able to design various series correction systems using the frequency response method.</p> <p>● Competence:</p> <p>1. Be able to correctly describe automatic control systems by using the basic knowledge, theories and methods of automatic control.</p> <p>2. Be able to analyze the stability, rapidity and accuracy of automatic control systems by applying automatic control theory and mathematical modeling methods.</p> <p>3. Be able to apply the theoretical knowledge and mathematical modeling methods of automatic control to the comparison and synthesis of solutions to related problems in the field of control engineering.</p> <p>4. Be able to analyze control engineering problems and formulate corresponding experimental schemes according to the performance index requirements of automatic control systems.</p> <p>5. Be able to correctly build the experimental system according to the scheme, conduct experiments safely, obtain experimental data, and properly screen, process and analyze the data to draw reasonable and effective conclusions.</p> <p>6. Be able to analyze and explain experimental results, and obtain reasonable and effective conclusions through information synthesis.</p>
Content	<p>A. Theoretical teaching (34 contact hours; 65 self-study hours)</p> <p>Chapter 1 Introduction (2 contact hours; 4 self-study hours)</p> <p>1) Basic concepts of automatic control; 2) Composition of automatic control systems; 3) Working principles and classification; 4) Performance requirements and design overview of automatic control systems.</p> <p>Chapter 2 Mathematical Models of Automatic Control Systems (8 contact hours; 14 self-study hours)</p> <p>1) Establishment and solution of system differential equations; 2) Definition and properties of transfer functions; 3) Typical elements and their transfer functions; 4) System block diagrams and equivalent transformations; 5) Signal flow graphs and Mason's formula.</p> <p>Chapter 3 Performance of Feedback Control Systems and Time-Domain Analysis Methods (8 contact hours; 16 self-study hours)</p>

	<p>1) Typical input signals and time-domain performance indicators;2) Time-domain response analysis of first-order systems; 3) Time-domain analysis of second-order systems and high-order systems; 4) Stability analysis of linear systems; 5) Steady-state error analysis of control systems.</p> <p>Chapter 4 Root Locus Method (4 contact hours; 8 self-study hours)</p> <p>1) Basic concepts of root locus; 2) Basic rules for plotting root locus; 3) Root locus analysis of control systems.</p> <p>Chapter 5 Frequency-Domain Analysis Method(8 contact hours; 15 self-study hours)</p> <p>1) Basic concepts and representation methods of frequency characteristics; 2) Frequency characteristics of typical elements; 3) Plotting of open-loop polar frequency response curves; 4) Plotting of open-loop Bode plots; 5) Nyquist stability criterion; 6) Logarithmic frequency stability criterion; 7) Relative stability analysis.</p> <p>Chapter 6 Design and Compensation of Control Systems(4 contact hours; 8 self-study hours)</p> <p>1) Design requirements,basic principles and design methods; 2) Compensation methods; 3) Basic control laws; 4) Series compensation.</p> <p>Part B.Experiment Teaching(6 contact hours; 0 self-study hours)</p> <p>Chapter 3 Performance of Feedback Control Systems and Time-Domain Analysis Methods(6 contact hours; 0 self-study hours)</p> <p>1) Typical Elements and Their Step Responses (2 class hours);</p> <p>2) Design of Second-Order Control Systems (2 class hours);</p> <p>3) Stability Analysis of Control Systems (2 class hours).</p>
Examination forms	Closed-book written examination
Study and examination Requirements	<p>1. Students shall independently complete the assignments after each class.Late arrival,early departure or unapproved absence is not allowed.</p> <p>2. The course assessment is a combination of usual grades,experiment grades and final examination grades,which comprehensively evaluates students' learning status and their ability to analyze and solve complex engineering problems.</p> <p>3.Usual assignments account for 10% of the total grade,quizzes account for 10%,experiments account for 20%,and the final examination accounts for 60%.4.All grades are evaluated on a 100-point scale,and 60 points is the passing score of this course.</p>
Reading list	<p>1.Required books</p> <p>[1] Zhang Yun (Chief Editor).Automatic Control Systems.Beijing: China Electric Power Press,2021 (second printing).</p> <p>[2] Hu Shousong (Chief Editor).Fundamental Course of Automatic Control Principles (4th Edition).Beijing: Science Press,2017.</p> <p>[3] Wang Yanwu (Chief Editor).Automatic Control Principles–Classical Control.Higher Education Press,2023.01.</p> <p>[4] Li Suling (Chief Editor).Automatic Control Theory.China Machine Press,2022.07.</p> <p>[5] Gong Erling.Automatic Control Principles.China Machine Press,2023.12.</p>
Data of last mendment	September 23,2025

Principles and Applications of Microcontrollers

Module designation	Principles and Applications of Microcontrollers
Semester(s) in which the module is taught Semester Offered	5th semester
Person responsible for the module	Du Bo
Language	Chinese
Relation to curriculum	<p>The Principles and Applications of Single Chip Microcontrollers is a fundamental course for the Electrical Engineering and Automation major. By studying this course, students will master the theoretical and practical knowledge related to the working principle of microcontrollers, programming languages, microcontroller interface technology, and its applications.</p> <p>This course is a course that combines theory and practice closely. In terms of theoretical teaching, it focuses on the explanation of basic theories and basic design methods; In terms of cultivating practical application abilities, emphasis is placed on enabling students to establish an engineering perspective, combined with practical teaching methods such as experiments and course design, so that students have the ability to analyze and solve complex engineering problems related to single-chip control systems in the field of electrical engineering.</p>
Teaching methods	<p>Target students: Automation major students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 40 hours Including</p> <p>Theoretical teaching: 34 hours</p> <p>Experiment teaching: 6 hours</p> <p>Size of class: 70-90</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 75 hours</p> <p>Contact hours = 40 hours</p> <p>Self-study hours = 35 hours</p>
Credit points	2.5 European credits 2.5
Required and recommended prerequisites for joining the module	Analog Electronic Technology, Digital Electronic Technology

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Master the structure and characteristics of microcontrollers,be able to utilize the on-chip resources of microcontrollers,analyze practical problems,design and apply them. 2.Design a microcontroller control system using a microcontroller and simple external devices. 3.Be able to apply the working principle and interface technology of microcontrollers,design reasonable and feasible experimental plans according to experimental requirements,combined with functional modules in experimental equipment. 4.Be able to correctly select functional modules from experimental equipment to build hardware platforms,write software programs,operate experimental equipment safely and standardly during the experiment,and obtain experimental results through software and hardware debugging. 5.By continuously improving the experimental plan through software and hardware debugging,reasonable and effective experimental results can be obtained. ● Skill: <ol style="list-style-type: none"> 1.Capable of utilizing theoretical knowledge of microcontrollers to design microcontroller control systems. 2.Attempt to solve practical problems using a microcontroller control system. ● Competence: <ol style="list-style-type: none"> 1.Enable students to deeply understand the national strategy of building a strong country through science and technology,and promote the development of scientific and technological innovation. 2.Enable students to possess the ability to analyze and solve complex engineering problems related to single-chip control systems in the field of electrical engineering.
<p>Content</p>	<p>A.Theoretical teaching(32 contact hours; 35 self-study hours)</p> <p>Chapter 1 Overview of Single Chip Microcomputer (2 contact hours; 116 self-study hours)</p> <p>Chapter 1 Overview of Single Chip Microcomputer (2 hours,2 self-study hours)</p> <ul style="list-style-type: none"> ●History of Microcontrollers ●Development trends of microcontrollers - ●Features and application fields of microcontrollers ●Typical series of microcontrollers <p>Chapter 2 Hardware structure of microcontrolle (6 contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Internal structure of microcontrollers ●Pin functions of microcontroller chips ●Central processing unit (CPU) ●Memory structure - Parallel I/O ports ●Clock circuit

	<ul style="list-style-type: none"> ●Reset circuit <p>Chapter 3 Fundamentals of C51 Programming Language (8contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Introduction to C51 programming language ●Fundamentals of C51 language programming ●Functions of C51 language <p>Chapter 4 Interrupt and Timing of Single Chip Microcomputer (4contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Interrupt system of microcontrollers ●Timer/counter of microcontrollers <p>Chapter 5 Serial port of microcontrolle (2contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Basic concepts of serial communication ●Structure and working modes of serial ports ●Typical applications of serial ports <p>Chapter 6 I/O Expansion Technology for Single Chip Microcontrollers(2contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Overview of I/O expansion ●8255 programmable parallel I/O port <p>Chapter 7 Interface design between microcontroller,keyboard,and monitor(4contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Keyboard and its interface ●Display and its interface <p>Chapter 8 Analog input/output channel (4contact hours; 116 self-study hours)</p> <ul style="list-style-type: none"> ●Interface design between microcontrollers and A/D converters ●Interface design between microcontrollers and D/A converters <p>Part B.Experiment teaching(6 contact hours)</p> <p>In order to help students better understand the principles of microcontrollers, master basic theoretical knowledge, and improve practical skills, we will arrange the following four typical experimental projects:</p> <p>Experiment 1: Timer experiment (2 contact hours)</p> <p>Experiment 2: I/O port input and output experiment(2 contact hours)</p> <p>Experiment 3: DC Motor Control Experiment (2 contact hours)</p> <p>Part C.Exercises teaching(2 contact hours)</p> <p>To help students better grasp the basic knowledge points, practice exercises are conducted.</p>
Examination forms	Closed-book written exam
Study and xamination Requirements	<ul style="list-style-type: none"> ●Students should independently complete homework after each class. Late arrivals, early departures, or unauthorized absences are not allowed. ●The standard for regular performance evaluation is 20%, including homework (60%) and stage assessment (40%). <p>Experiment (10%)</p> <p>Regular grades account for 20%, experiments (10%), and final exams (closed book written exams) account for 70%.</p>

09 Module Descriptions

<p>Reading list</p>	<p>1.Required books [1] Huang Jin,Li Jianbo.Digital Image Processing:Principle and Implementation[M].Beijing:Tsinghua University Press,2020.(in Chinese)</p> <p>2.Reference books [1] Zhang Yigang Principles and Interface Technology of Single Chip Microcomputer (C51 Programming) Beijing: People's Posts and Telecommunications Press,2021 [2] Zhang Yigang Principles and Applications of Single Chip Microcontrollers - C51 Programming+Rotorus Simulation Beijing: Higher Education Press,2021 [3] Zhang Yigang Principles and Applications of Single Chip Microcontrollers Beijing: Higher Education Press,2016 [4] Xu Aijun Practical Tutorial on Microcontroller Principles - Based on Proteus Virtual Simulation Beijing: Electronic Industry Press,2014 [5] Guo Tianxiang New Concept 51 Microcontroller C Language Tutorial: A Comprehensive Guide to Getting Started,Improving,Developing,and Expanding Beijing: Electronic Industry Press,2018</p>
<p>Data of last mendment</p>	<p>January 9,2026</p>

Power Electronics

Module designation	Power Electronics
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Liang Chunhui
Language	Chinese
Relation to curriculum	<p>“Power Electronics ” is a fundamental technical course for the field of Electrical Engineering and Automation.It is a subject that closely integrates theory with practice,focusing on the basic principles of power conversion and energy conservation.Through the study of this course,students acquire an understanding of the basic characteristics,operating principles,and common issues associated with major power electronic devices.They also learn about the features,fundamental principles,control methods,and analysis techniques of power electronic conversion circuits.In terms of theoretical content,the course emphasizes the explanation of basic knowledge,fundamental theories,and analytical methods.With regard to the development of practical application skills,the course aims to help students establish an engineering perspective,and to focus on the training of experimental skills and the design of experimental procedures.This enables students to possess the necessary abilities to analyze and research power electronics technology,thereby enhancing their capacity to solve complex electrical engineering problems.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students Type of teaching: Theoretical teaching and experimental teaching Teaching methods:Case method;Questioning method;Heuristic teaching Contact hour: 48 hours Including Theoretical teaching: 42 hours Experiment teaching: 6 hours Size of class: 70-80</p>
Workload (incl.contact hours, self-study hours)	<p>Total workload = 135 hours Contact hours = 48 hours Self-study hours = 87 hours</p>
Credit points	3.0 European credits 4.5
Required and recommended prerequisites for joining the module	<p>Advanced Mathematics,Circuit Theory,Analog Electronic Technology,Theory of Electrical Machine</p>
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1.Understand the basic principles and knowledge of power electronics technology,as well as power electronic devices and their relevant parameters.</p>

	<p>2.Be familiar with the structural characteristics of the four main types of power electronic conversion circuits,and master the basic principles and analysis methods of these circuits.</p> <p>● Skill:</p> <p>1.Possess the skills necessary to express and model power electronic conversion circuits,as well as to perform mathematical derivations,calculations,and analyses.</p> <p>2.Master the standard procedures for conducting power electronics experiments,as well as the skills required for data acquisition and basic analysis.</p> <p>● Competence:</p> <p>1.Be able to use the basic theories of power electronics technology to analyze the characteristics and operating modes of power conversion systems.</p> <p>2.Possess a basic ability to apply the fundamental theories,models,calculation methods,and analysis techniques of power electronics in order to solve complex engineering problems related to power electronic conversion circuits.</p>
Content	<p>A.Theoretical teaching(48 contact hours; 87self-study hours)</p> <p>Chapter 1 Introduction (2 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ●Concept of power electronics technology ●Development of power electronics technology ●Applications of power electronics technology ●Basic types of power electronic conversion circuits <p>Chapter 2 Power electronic devices (8 contact hours; 16 self-study hours)</p> <ul style="list-style-type: none"> ●Overview of power electronic devices: Power diodes ●Power diodes ●Half-controlled devices (Thyristors) ●Typical fully-controlled devices (GTO,power MOSFET,GTR,IGBT,etc.) ●Common issues of power electronic devices (drive circuits,protection circuits,etc.) <p>Chapter 3 rectifier circuit (10 contact hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ●Single-phase controlled rectifier circuits ●Three-phase controlled rectifier circuits ●Effect of rectifier transformer leakage reactance on rectifier circuits,harmonics and power factor of rectifier circuits ●High-power controlled rectification,active inversion operation of rectifier circuits ●Drive control of phase-controlled rectifier circuits <p>Chapter 4 Inverter Circuits (5 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ●Voltage-source inverter circuits ●Current-source inverter circuits

	<ul style="list-style-type: none"> ●Multi-module inverter circuits and multi-level inverter circuits <p>Chapter 5: DC-DC Conversion Circuits (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●Basic chopper circuits ●Composite chopper circuits and multiphase multiple chopper circuits <p>Chapter 6: Communication-AC-DC conversion circuits (5 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● AC power control circuits ● Cycloconverter circuits ● Matrix converter circuits <p>Chapter 7 PWM Control Technology (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ●Basic principle of PWM control ●PWM inverter circuits and their control methods <p>Chapter 8: Soft-Switching Technology (2 contact hours; 2 self-study hours)</p> <ul style="list-style-type: none"> ●Concept and classification of soft-switching circuits ●Typical soft-switching circuits <p>Chapter 9 Applications of Power Electronics Technology (2 contact hours; 3 self-study hours)</p> <ul style="list-style-type: none"> ● Applications of Power Electronics Technology in Electrical Engineering <p>Part B.Experiment teaching(16 contact hours; 10 self-study hours)</p> <p>In order to help students better understand the basic structure and principles of power electronic conversion circuits,to master the methods for analyzing such circuits,and to improve their practical skills,we have arranged the following three typical experimental projects:</p> <p>Experiment 1: Performance study of single-phase bridge-type controlled rectifier circuits(2 contact hours; 2 self-study hours)</p> <p>Experiment 2: Performance study of three-phase bridge-type controlled rectifier circuits (2 contact hours; 2 self-study hours)</p> <p>Experiment 1: Performance study of DC chopper circuits(2 contact hours; 2 self-study hours)</p>
Examination forms	Closed-book written exam
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students must complete the homework assigned after each class independently.Late arrivals,early departures,or unapproved absences are not permitted. ● The weight of regular assessments is 40%,and this includes homework (10%),experiments (20%),and quizzes (10%). <p>Regular assessments account for 40%,while the final assessment (a closed-book exam) accounts for 60%.</p>
Reading list	<p>1. Required books</p> <p>[1] Liu Jinjun,Wang Zhaoan.Power Electronics Technology [M].6th edition.Beijing: China Machine Press,2022.(Chinese)</p> <p>2.Reference books</p> <p>[1] Huang Jun,Wang Zhaoan.Power Electronics Conversion Technology [M].3rd edition.Beijing: China Machine Press,2017.(Chinese)</p>

09 Module Descriptions

	<p>[2] Pei Yunqing,Zhuo Fang,Wang Zhaoan.Exercise Book and Simulation for Power Electronics Technology [M].5th edition.Beijing: China Machine Press,2012.(Chinese)</p> <p>[3] Wang Zhaoan,Zhang Mingxun.Manual on the Design and Application of Power Electronics Equipment [M].3rd edition.Beijing: China Machine Press,2009.(Chinese)</p> <p>[4] Li Hong.Fundamentals of Modern Power Electronics Technology [M].Beijing: China Machine Press,2010.(Chinese)</p> <p>[5] Zhou Yuanshen.Power Electronics Technology and MATLAB Simulation [M].2nd edition.Beijing: China Machine Press,2014.(Chinese)</p>
Data of last mendment	January 21,2026

Power System Analysis

Module designation	Power System Analysis
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Zhao Xu
Language	Chinese
Relation to curriculum	<p>This course serves as a core specialized module for the Electrical Engineering and Automation program, characterized by a strong integration of theoretical fundamentals and practical applications. Through this course, students will master the basic principles and analytical methods of power system analysis, as well as the operational characteristics and calculation approaches for steady-state processes, electromagnetic transient processes, and electromechanical transient processes in power systems.</p> <p>By combining theoretical instruction with comprehensive practical sessions, this course aims to enhance students' capabilities in power system engineering calculations, computer-aided analysis, and problem-solving. It also equips students with the necessary knowledge and skills for power system operation, fosters an engineering-oriented mind set, and strengthens their ability to address complex electrical engineering challenges.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Theoretical teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 72 hours Including</p> <p>Theoretical teaching: 72 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 195 hours</p> <p>Contact hours = 72 hours</p> <p>Self-study hours = 123 hours</p>
Credit points	4.5
Required and recommended prerequisites for joining the module	Advanced Mathematics, Circuit Theory, Electrical Machinery

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Master the basic principles and fundamental theories of power system analysis,and conduct calculations for power flow,voltage regulation,symmetrical faults,and asymmetrical faults in power networks. 2.Apply the basic theories and methods of power systems to analyze the steady-state and transient operating conditions of power systems. ● Skill: <ol style="list-style-type: none"> 1.Be able to apply the methods of engineering fundamentals,professional knowledge,and mathematical modeling to the comparison and synthesis of solutions for electrical engineering problems. ● Competence 能力: <ol style="list-style-type: none"> 1.Apply relevant scientific principles of electrical engineering to identify and determine the key components and parameters of complex electrical engineering problems,and conduct effective decomposition and analysis by integrating professional knowledge. 2.Utilize fundamental theories and methods of electrical engineering,and through literature research,analyze the influencing factors of processes to derive valid conclusions.
<p>Content</p>	<p>Theoretical teaching(72 contact hours; 123 self-study hours)</p> <p>Part 1: Steady-State Operation of Power Systems (28 lecture hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Concepts of Power Systems ● Parameters and Equivalent Circuits of Power Network Components ● Power Flow Calculation for Simple Power Systems ● Active Power Balance and Frequency Regulation in Power Systems ● Reactive Power Balance and Voltage Regulation in Power Systems ● Economic Operation of Power Systems <p>Part 2: Electromagnetic Transient Processes in Power Systems (24 lecture hours; 16 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Equations of Synchronous Machines ● Transient Processes of Three-Phase Short Circuits in Power Systems ● Practical Calculation of Three-Phase Short-Circuit Currents in Power Systems ● Sequence Impedances and Equivalent Circuits of Power System Components ● Analysis and Calculation of Simple Unsymmetrical Faults in Power Systems <p>Part 3: Electromechanical Transient Processes in Power Systems (12 lecture hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● Basic Concepts of Power System Stability ● Static Stability of Power Systems ● Transient Stability of Power Systems

	<p>Part 4:Computer Algorithms for Power System Power Flow Calculation (8 lecture hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Mathematical Models of Power Systems ● Computer Algorithms for Power System Power Flow Calculation
Examination forms	Close-book written examination
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class.Late arrivals,early departures,or unauthorized absences are not permitted. ●The regular performance evaluation is 20%,including homework (60%) and stage assessment (40%); the final assessment (close-book written test) accounts for 80%.

Power System Protective Relaying

Module designation	Power System Protective Relaying
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Li Linlin
Language	Chinese
Relation to curriculum	<p>Power System Relay Protection is a core professional course for the major of Electrical Engineering and Automation. This course mainly introduces the common theories and technologies of relay protection, including graded current protection and distance protection for power grids, pilot protection for transmission lines, automatic reclosing, power transformer protection, generator protection, and busbar protection.</p> <p>Through studying this course, students can master the basic principles of power system relay protection, apply the theory of power system fault analysis to identify the operating status of power systems, establish mathematical models for fault calculation, formulate relay protection configuration schemes, conduct protection setting calculation for electrical components in power systems, and evaluate the rationality of relay protection schemes.</p>
Teaching methods	<p>Target students:</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 56 hours Including</p> <p>Theoretical teaching: 52 hours</p> <p>Experiment teaching: 4 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 165 hours</p> <p>Contact hours = 56 hours</p> <p>Self-study hours = 109 hours</p>
Credit points	3.5 European credits 5.5
Required and recommended prerequisites for joining the module	<p>Power System Analysis</p> <p>Electrical Engineering of Power Plants</p>
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <p>● Knowledge:</p> <p>1. Be able to apply fault characteristics of power components, identify and correctly utilize differences of measurable parameters under various operating conditions, so as to form the basic principles of relay protection. 2. Be able to establish mathematical models for relay protection</p>

	<p>setting calculation of power networks,conduct relay protection setting calculation and evaluation for power components in accordance with national and industrial design standards.</p> <p>3.Be able to apply basic theories and methods of relay protection to analyze factors affecting the correct operation of protection systems and propose corresponding measures.</p> <p>● Skill:</p> <ol style="list-style-type: none"> 1. Be able to correctly use relay protection test equipment to test relays and obtain experimental data from test results. 2.Be able to properly screen and process experimental data,and draw reasonable and effective conclusions through comprehensive information analysis. <p>● Competence:</p> <ol style="list-style-type: none"> 1. Able to apply scientific principles related to electrical engineering to identify and judge key links and parameters of complex electrical engineering problems,and conduct effective decomposition and analysis combined with professional knowledge. 2. Able to model and represent each link of complex electrical engineering problems based on professional knowledge and mathematical modeling methods,ensuring that the models meet simulation and engineering calculation requirements. 3.Able to apply basic theories and methods of electrical engineering,conduct literature research,analyze influencing factors,and draw effective conclusions.
Content	<p>A.Theoretical teaching(52 contact hours; 107 self-study hours)</p> <p>Chapter 1 Summary (4 contact hours; 8 self-study hours)</p> <ol style="list-style-type: none"> 1. Faults and abnormal operating conditions of power systems 2. Tasks of relay protection 3. Basic principles and configuration of relay protection 4. Basic requirements for relay protection <p>Chapter 2 Over-current Protection for Phase Faults (10 contact hours; 20 self-study hours)</p> <ol style="list-style-type: none"> 1. Relay characteristics of relays 2. Short-circuit current calculation for single-source power systems 3. Operating principles and setting calculation of instantaneous overcurrent protection,time-limited instantaneous overcurrent protection,and definite-time overcurrent protection 4. Connection modes,schematic diagrams and expanded connection diagrams of current protection <p>Chapter 3 Directional Over-current Protection (4 contact hours; 8 self-study hours)</p> <ol style="list-style-type: none"> 1. Operating principle of directional overcurrent protection 2. Connection modes of power direction elements 3. Application characteristics of directional overcurrent protection <p>Chapter 4 Zero Sequence Current and Directional Protection for Earth</p>

	<p>Faults in the Neutral Directly Grounded System (2 contact hours; 4 self-study hours)</p> <ol style="list-style-type: none"> 1. Characteristics of zero-sequence current and voltage after ground fault in neutral point directly grounded systems 2. Setting calculation principles of graded zero-sequence current protection 3. Directional zero-sequence current protection <p>Chapter 5 Protection System for Single Phase Earth Fault in the Neutral Indirectly Earth Systems (2 contact hours; 4 self-study hours)</p> <ol style="list-style-type: none"> 1. Single-phase grounding characteristics in low-resistance grounding systems,principles of zero-sequence protection for low-resistance grounding systems 2. Characteristics of single-phase grounding faults in neutral grounding systems via arc-suppression coil 3. Principles of zero-sequence protection for low-resistance grounding systems <p>(1) Chapter 6 Distance Protection (10 contact hours; 4 self-study hours)</p> <ol style="list-style-type: none"> 1. Operating principle of distance protection 2. Characteristics,connection and implementation of impedance elements 3. Setting calculation of stepped distance protection 4. Factors affecting distance protection <p>Chapter 7 Pilot Protection for Transmission Lines (6 contact hours; 4 self-study hours)</p> <ol style="list-style-type: none"> 1. Basic principles and implementation methods of transmission line pilot protection 2. Directional comparison pilot protection 3. Pilot current differential protection <p>Chapter 8 Auto-Reclosure for Transmission Lines (2 contact hours; 2 self-study hours)</p> <ol style="list-style-type: none"> 1. Functions of automatic reclosing and basic requirements for it 2. Three-phase one-shot automatic reclosing for transmission lines 3. Single-phase automatic reclosing for high-voltage transmission lines 4. Comprehensive automatic reclosing for high-voltage transmission lines <p>Chapter 9 Power Transformer Protection (8 contact hours; 4 self-study hours)</p> <ol style="list-style-type: none"> 1. Transformer fault types,abnormal operating conditions and protection configuration principles 2. Transformer gas protection 3. Transformer longitudinal differential protection 4. Transformer inrush current and its identification methods 5. Transformer backup protection 6. Transformer protection configuration <p>Chapter 10 Generator Protection</p>
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	<p>(2 contact hours; 2 self-study hours)</p> <p>1. Generator faults, abnormal operating conditions and corresponding protection schemes</p> <p>2. Generator stator protection</p> <p>Chapter 11 Bus bar Protection</p> <p>(2 contact hours; 2 self-study hours)</p> <p>1. Busbar differential protection</p> <p>2. Circuit-breaker failure protection</p> <p>Part B. Experiment teaching (4 contact hours; 2 self-study hours)</p> <p>In order to help students better understand the power system protective relaying, master protective relaying learning methods, and improve practical skills, we will arrange the following two typical experimental courses:</p> <p>Experiment 1:</p> <p>Experiment 2:</p>
Examination forms	Closed-book written exam
Study and examination Requirements	<ul style="list-style-type: none"> • Students shall complete the after-class assignments independently. Being late, leaving early, or unapproved absences are not allowed. • The standard for regular grade is 30%, including assignments (10%), experiments (10%), and periodic assessments (10%). Regular grade accounts for 30%, and the final assessment (closed-book written examination) accounts for 70%.
Reading list	<p>1. Required books</p> <p>[1] ZHANG Baohui, YIN Xianggen, et al. Power system protective relaying [M]. 2nd ed. Beijing: China Electric Power Press, 2022. (in Chinese)</p> <p>3. Reference books</p> <p>[1] National Energy Administration. Regulation for operation of 220kV ~ 750kV relay protection devices in power grids: DL/T 559—2018 [S]. Beijing: China Electric Power Press, 2018. (in Chinese)</p> <p>[2] HE Jiali, LI Yongli, DONG Xinzhou, et al. Principles of relay protection of electric power system [M]. 5th ed. Beijing: China Electric Power Press, 2018. (in Chinese)</p> <p>[3] State Administration for Market Regulation, Standardization Administration of the People's Republic of China. Technical code for relaying protection and security automatic equipment: GB/T 14285—2023 [S]. Beijing: Standards Press of China, 2023. (in Chinese)</p>
Data of last mendment	December 19, 2025

Electrical Engineering of Power Plants

Module designation	Electrical Engineering of Power Plants
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Zhao Xu
Language	Chinese
Relation to curriculum	<p>Power Plant Electrical Engineering is a specialized course for the major of Electrical Engineering and its Automation. It is also a course that integrates theory with practice in a relatively close manner. Through the study of this course, students will master the characteristics, operation analysis and design principles of the main electrical connection forms of power plants and substations; the power plant (substation) auxiliary power system; the structure, principle and selection verification of high-voltage electrical equipment; the selection and verification of conductors; high-voltage distribution devices and the operation of power transformers, and other basic theoretical knowledge.</p> <p>By learning the current national and industry design standards, regulations and typical engineering cases, students will establish an engineering perspective and improve their ability to identify, analyze and solve complex electrical engineering problems such as system design, equipment operation and maintenance, and fault analysis.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Theoretical teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 48 hours Including</p> <p>Theoretical teaching: 48 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 135 hours</p> <p>Contact hours = 48 hours</p> <p>Self-study hours = 87 hours</p>
Credit points	3.0 European credits 4.5
Required and recommended prerequisites for joining the module	Electrical Motor, Power System Analysis, Professional practice knowledge

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Be capable of designing reasonable main electrical connection schemes and auxiliary power systems for plants and substations in accordance with design principles,methods and procedures,and in combination with engineering practice. 2.In accordance with the Technical Regulations for Selection of Conductors and Electrical Appliances,conductors and electrical equipment shall be selected rationally.Under constraints such as safety and environmental requirements,the type and layout scheme of power distribution devices shall be selected and determined. 3.The basic theories of transformer operation shall be applied to analyze the parallel operation conditions and influencing factors of transformers,as well as the load distribution of auto-transformers in operation. ● Skill: <ol style="list-style-type: none"> 1.Formulate solutions to electrical engineering problems in compliance with the design principles,methodologies,and procedures specific to electrical engineering. 2.Precisely adhere to technical standards and specifications,integrate emerging technologies,advanced equipment,and innovative processes in electrical engineering for the design of electrical systems,while embodying a sense of innovation throughout the design process. ● Competence: <ol style="list-style-type: none"> 1.Possess a command of engineering design methodologies and relevant technologies in the field of electrical engineering,and demonstrate the ability to analyze various factors influencing design objectives and technical schemes.
<p>Content</p>	<p>Theoretical teaching(48 contact hours; 87self-study hours)</p> <p>Chapter 1 Electrical Main Wiring (12 lecture hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ● Design Principles for Electrical Main Wiring ● Basic Topologies of High-Voltage Distribution Equipment and Their Applicable Scenarios ● Applications of Electrical Main Wiring ● Selection of Main Transformers ● Approaches to Short-Circuit Current Limitation <p>Chapter 2 Auxiliary Power System (8 lecture hours; 7 self-study hours)</p> <ul style="list-style-type: none"> ● Auxiliary Loads of Power Plant (or Substation) ● Voltage Grades for Auxiliary Power System of Power Plant (or Substation) ● Busbar Configurations for Auxiliary Power System of Power Plant (or

	<p>Substation)</p> <ul style="list-style-type: none"> ● Tapping of Auxiliary Power Sources for Power Plant (or Substation) ● Selection of Auxiliary Transformers and Voltage Verification During Motor Starting <p>Chapter 3 Selection of High-Voltage Electrical Apparatus (12 lecture hours; 20self-study hours)</p> <ul style="list-style-type: none"> ● General Criteria for the Selection of High-Voltage Electrical Apparatus ● High-Voltage Circuit Breakers and High-Voltage Isolating Switches ● Current Transformers and Voltage Transformers ● Reactors,High-Voltage Load Switches,and Fuses <p>Chapter 4 Conductor Selection (4 lecture hours; 20 self-study hours)</p> <ul style="list-style-type: none"> ● Rigid Conductors ● Phase-Separated Enclosed Busbars and Common-Box Busbars ● Flexible Conductors <p>Chapter 5 High-Voltage Distribution Equipment (8 lecture hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● Design Principles and Specifications ● Indoor Distribution Equipment ● Outdoor Distribution Equipment ● Complete Switchgear Assemblies <p>Chapter 6 Operation of Power Transformers (4 lecture hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● Heat Generation and Heat Dissipation of Power Transformers ● Insulation Aging of Power Transformers ● Normal Overload and Emergency Overload of Power Transformers ● Characteristics and Operating Modes of Auto-Transformers ● Parallel Operation of Power Transformers
Examination forms	Close-book written examination
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class.Late arrivals,early departures,or unauthorized absences are not permitted. ●The regular performance evaluation is 30%,including homework (80%) and stage assessment (20%); the final assessment (close-book written test) accounts for 70%.
Reading list	<p>1. Reference books</p> <p>[1]Miao,S.H.(Ed.).Electrical Section of Power Plants (5th ed.).Beijing: China Electric Power Press.(2015).</p> <p>[2]Yao,C.Q.(Ed.).Electrical Section of Power Plants.Beijing: China Electric Power Press.(2007).</p> <p>[3]DL/T 5153-2014.Technical Specifications for Auxiliary Power System Design of Thermal Power Plants.Beijing: China Electric Power Press.(2014).</p> <p>[4]NB/T 35044-2014.Design Code for Auxiliary Power System of Hydropower Plants.Beijing: China Electric Power Press.(2014).</p> <p>[5]DL/T 5155-2016.Technical Specifications for Auxiliary Power System</p>

09 Module Descriptions

	<p>Design of 220 kV–1000 kV Substations.Beijing: China Electric Power Press.(2016).</p> <p>[6]DL/T 5352-2018.Technical Specifications for High-Voltage Distribution Equipment Design.Beijing: China Electric Power Press.(2018).</p> <p>[7]Electric Power Engineering Design Manual: Primary Electrical Design of Thermal Power Plants.Beijing: China Electric Power Press.(2018).</p>
Data of last mendment	June 29,2025

High Voltage Technique

Module designation	High Voltage Technique
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Liu Wanglai
Language	Chinese
Relation to curriculum	<p>This core course for Electrical Engineering and Automation majors combines a comprehensive theoretical framework with strong practical applications. It covers high-voltage insulation and testing, along with the concepts, theories, and methods of overvoltage in power systems and protective measures. Students will master the fundamental theories of dielectric discharge and techniques to enhance dielectric strength, gain familiarity with dielectric characteristics, and understand the causes, influencing factors, and mitigation strategies for overvoltage in power systems.</p> <p>The course focuses on the cultivation of students' awareness of electrical safety. With the help of engineering cases and modern learning tools, the course guides and cultivates students' ability to analyze problems, so that students can creatively analyze and solve complex engineering problems related to insulation and overvoltage.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Theoretical teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 48 hours Including</p> <p>Theoretical teaching: 48 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 135 hours</p> <p>Contact hours = 48 hours</p> <p>Self-study hours = 87 hours</p>
Credit points	3.0 European credits 4.5

<p>Required and recommended prerequisites for joining the module</p>	<p>Electrical Engineering, Power System Analysis, Electrical Systems in Power Plants</p>
<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Understand the electrical characteristics and evaluation parameters of dielectric polarization, conductivity and dielectric loss, and be familiar with the dielectric discharge theory, factors affecting electrical strength and measures to improve electrical strength. 2. The paper introduces the mechanism of overvoltage in power system, the influencing factors and the measures to limit overvoltage. ● Skill: <ol style="list-style-type: none"> 1. The virtual simulation test of DC electric field air gap discharge can be completed. ● Competence: <ol style="list-style-type: none"> 1. Through the study of the main factors affecting the electrical properties of dielectric, the complexity of insulation problem and the diversity of solving the insulation problem are recognized. The more reasonable solution to improve the electrical strength of dielectric is given through the literature study. 2. The paper can identify the insulation and wave process problems in complex electrical engineering problems, and use the basic theory and parameters of insulation and wave process to study the related problems. The paper can identify the insulation and wave process problems in complex electrical engineering problems, and use the basic theory and parameters of insulation and wave process to study the related problems. 3. Based on the basic theory and protection method of external overvoltage and internal overvoltage, reasonable protection measures are given.
<p>Content</p>	<p>Theoretical teaching(48 contact hours; 87 self-study hours)</p> <p>Chapter 1 Introduction/Dielectric Polarization, Conductivity and Loss (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Introduction ● Dielectric Polarization ● Dielectric conductivity ● Dielectric loss <p>Chapter 2 Dielectric strength of gas medium (18 contact hours; 35 self-study hours)</p> <ul style="list-style-type: none"> ● Generation and Dissipation of Charged Particles in Air Gaps ● Voltammetric Characteristic Curves and Townsend Theory ● Paraxial Law

	<ul style="list-style-type: none"> ● Flow Theory and Pilot Main Discharge ● Gas Discharge in Non-uniform Electric Fields ● Breakdown Characteristics of Air Gaps under Impulse Voltage ● Dielectric Strength of Gas Media ● Methods to Improve Air Gap Breakdown Voltage ● Surface Discharge <p>Chapter 3 Electrical Strength of Liquid and Solid Media (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Breakdown of liquid medium ● Breakdown of solid medium ● Electrical strength of composite insulation ● Aging of dielectric <p>Chapter 4 Wave Process in the Line and Winding (6 contact hours; 12 self-study hours)</p> <ul style="list-style-type: none"> ● Wave Propagation in Nondestructive Single-Wire Systems ● Refraction and Reflection of Traveling Waves ● Traveling Waves Passing Through Series Inductors and Parallel Capacitors ● Multiple Reflections of Traveling Waves ● Wave Propagation in Parallel Multi-Wire Systems ● Impact of Impulse Corona on Wave Propagation in Lines ● Wave Propagation in Winding Systems ● Wave Propagation in Rotating Motor Windings <p>Chapter 5 Lightning parameters and lightning protection equipment (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Lightning parameters and lightning discharge calculation model ● Direct lightning protection equipment ● Intrusion wave protection equipment ● Lightning protection grounding <p>Chapter 6 Lightning protection for transmission lines (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Induced lightning overvoltage ● Direct lightning overvoltage ● Lightning-induced tripping rate ● Lightning protection measures for power lines <p>Chapter 7 Lightning Protection for Power Plants and Substations (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Direct lightning protection for power plant substations ● Protective function of valve-type surge arresters ● Protection of incoming lines in substations ● Lightning protection for transformers ● Lightning protection for substations ● Lightning protection for rotating machinery <p>Chapter 8 Internal overvoltage (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Overvoltage on unloaded line
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09 Module Descriptions

	<ul style="list-style-type: none"> ● Overvoltage on closed unloaded line ● Overvoltage on unloaded transformer ● Overvoltage on arc grounding ● Increased power frequency voltage ● Resonant overvoltage
Examination forms	Open-book written examination
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class.Late arrivals,early departures,or unauthorized absences are not permitted. ●The regular performance evaluation is 30%,including homework (80%) and stage assessment (20%); the final assessment (open-book written test) accounts for 70%.
Reading list	<p>1.Required books</p> <p>[1] Liu Wanglai.High Voltage Technology [M].Beijing: China Water & Power Press,2024.(Chinese)</p> <p>2.Reference books</p> <p>[1] Shen Qigong,Fang Yu,Zhou Zecun,Wang Dazhong.High Voltage Technology [M].4th Edition.China Electric Power Press,2012.(Chinese) [2] Zhao Zhida.High Voltage Technology [M].4th Edition.China Electric Power Press,2020.(Chinese)</p>
Data of last mendment	June 29,2025

Power Technology Economics and Management

Module designation	Power Technology Economics and Management
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Zhou Jinghong
Language	Chinese
Relation to curriculum	<p>This course is a distinctive compulsory course for the Electrical Engineering and Automation major, aiming to equip students with fundamental knowledge of economics and management. Its core content focuses on the principles and methods of techno-economic analysis in electrical engineering, serving as a basic tool for improving economic benefit analysis in electrical engineering practice. Through this course, students will be able to master the basic theories, methods, and skills of engineering economics. Students will gain a systematic understanding of economic evaluation indicators and methods for electrical engineering projects, project feasibility studies, equipment replacement, and technological innovation.</p> <p>The main objective of this course is to cultivate students' awareness and competence in economic management and to help them develop sound economic perspectives. Upon completing the course, students will initially acquire the ability to apply fundamental knowledge and general principles of power engineering economics and management to analyze and solve economic decision-making problems in electrical engineering projects.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering Type of teaching: Theoretical teaching Teaching methods: Case method; Questioning method; Heuristic teaching Contact hour: 24 hours Including Theoretical teaching: 24 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 70-80</p>
Workload (incl. contact hours)	<p>Total workload = 60 hours Contact hours = 24 hours Self-study hours = 36 hours</p>
Credit points	1.5 European credits 2.0

Required and recommended prerequisites for joining the module	Introduction to Electrical Engineering
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Students will be able to understand the importance and general principles of management and economic decision-making in electrical engineering projects, be familiar with economic evaluation indicators and their calculation methods, and master economic evaluation and decision-making methods for technical solutions in electrical engineering. 2. Students will be able to apply economic analysis methods of electrical engineering to conduct feasibility studies during the design and development stages of electrical engineering projects, and to evaluate the economic efficiency of alternative solutions in technology upgrading and renovation projects. ● Competence: <ol style="list-style-type: none"> 1. The concept of electrical engineering economics; the meaning and principles of economic benefits; the principles, comparability analysis, and general procedures of electrical engineering economic analysis; economic analysis methods; the meaning and calculation of techno-economic analysis indicators; evaluation methods for independent alternatives and mutually exclusive alternatives; and methods for uncertainty analysis. 2. Feasibility studies of electrical engineering projects, financial evaluation of power projects, and economic analysis of technological upgrading and replacement of electrical equipment.
Content (课程内容)	<p>Theoretical teaching(24 contact hours; 36 self-study hours)</p> <p>Chapter 1: Fundamentals of Techno-Economic Analysis of Electrical Engineering Projects (4 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of power engineering economics ● Basic elements of power engineering economic analysis <p>Chapter 2: Cash Flow and Time Value of Money Calculations (3 contact hours; 5 self-study hours)</p> <ul style="list-style-type: none"> ● Concept and components of cash flow ● Concept of the time value of money and calculation of equivalent values of funds <p>Chapter 3: Economic Evaluation Indicators and Methods for Power Engineering Projects (11 contact hours; 16 self-study hours)</p> <ul style="list-style-type: none"> ● Static evaluation methods and indicators ● Dynamic evaluation methods and indicators ● Alternative schemes and economic evaluation methods ● Uncertainty analysis <p>Chapter 4: Feasibility Study of Electrical Engineering Projects (2 contact hours; 3 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of feasibility studies for power projects

	<ul style="list-style-type: none"> ● Basic contents of feasibility studies for power projects <p>Chapter 5: Financial Evaluation of Power Projects (2 contact hours; 3 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of financial evaluation of power projects and major financial statements ● Calculation and analysis of financial evaluation indicators for power projects <p>Chapter 6: Techno-Economic Analysis of Power Equipment Renewal (2 contact hours; 3 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of electrical equipment renewal ● Electrical equipment renewal and its techno-economic analysis
Examination forms	Comprehensive Report
Study and examination Requirements	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class. Late arrivals, early departures, or unauthorized absences are not permitted. ● The regular performance evaluation is 20%, including homework (100%); the final assessment (Comprehensive Report) accounts for 80%.
Reading list	<p>Reference books</p> <p>[1] Xiao Xianyong (Ed.). <i>Principles of Power Engineering Economics</i>. Beijing: China Electric Power Press, 2010.</p> <p>[2] Liu Qihua and Wu Ling (Eds.). <i>Economic Analysis of Power Engineering Technology</i>. Beijing: China Electric Power Press, 2012.</p> <p>[3] Fu Jiaji (Ed.). <i>Industrial Engineering Economics</i>. Beijing: Tsinghua University Press, 2014.</p> <p>[4] Xu Li (Ed.). <i>Engineering Economics</i>. Wuhan: Wuhan University Press, 2013.</p>
Data of last amendment	January 21, 2026

Electricity Market

Module designation	Electricity Market
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Zhou Jinghong
Language	Chinese
Relation to curriculum	<p>This course is a distinctive specialty course for the Electrical Engineering and Automation major. It introduces students to the market structure, operating models, trading theories, electricity pricing management, and dispatch and operation of power markets, as well as the successful experiences of power industry market-oriented reforms in developed countries and the existing problems and corresponding measures in the construction of China's power market.</p> <p>By applying principles of economics, the course explains the theories and management approaches related to power market operation in the process of power industry marketization. Through this course, students will gain an understanding of power markets and their operations. Upon completion, students will have a solid foundational knowledge of power markets and their operation, and will be prepared to become interdisciplinary professionals with expertise in both economics and engineering.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Theoretical teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 16 hours Including</p> <p>Theoretical teaching: 16 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 16 hours</p> <p>Self-study hours = 29 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	<p>Advanced Mathematics</p> <p>Power System Analysis</p>
Module objectives/	Learning outcomes:

<p>intended learning outcomes</p>	<ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Students will be able to understand the reform process of power industry marketization and the operational theories of power markets, and to re-examine the theoretical approaches to power generation, transmission, and electricity sales from an economic perspective. 2. Students will be able to apply relevant power market theories and methods to analyze and solve practical problems in power systems. ● Competence: <ol style="list-style-type: none"> 1. Through the study of the main factors affecting the electrical properties of <ol style="list-style-type: none"> 1. Master management and economic decision-making methods involved in electrical engineering projects. 2. Be familiar with the cost structure of electrical engineering projects, understand the engineering management and economic decision-making issues involved, and be able to apply engineering management and economic decision-making methods in the design and development of solutions for electrical engineering projects in a multidisciplinary environment.
<p>Content</p>	<p>Theoretical teaching(16 contact hours;29 self-study hours)</p> <p>Chapter 1: Basic Concepts of Power Markets and Economics (6 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of power markets ● Basic concepts of economics <p>Chapter 2: Market Transactions of Electrical Energy (4 contact hours; 7 self-study hours)</p> <ul style="list-style-type: none"> ● Special characteristics of electricity as a commodity and the theoretical basis of electricity pricing ● Market trading of electrical energy ● Economic models of power markets and settlement of electricity transactions <p>Chapter 3: Analysis of the Characteristics of Power Market Supply and Demand Participants (3 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Demand side and demand response ● Power generators <p>Chapter 4: System Security and Ancillary Services (3 contact hours; 6 self-study hours)</p> <ul style="list-style-type: none"> ● Demand for ancillary services in power systems and procurement mechanisms ● Implementation of ancillary service market mechanisms and decision-making issues of power generators
<p>Examination forms</p>	<p>Comprehensive Report</p>

Study and examination Requirements	<ul style="list-style-type: none"> ●Continuous assessment mainly consists of assignment evaluation.The assignments are designed to assess students’ understanding and mastery of the knowledge points corresponding to each course objective.There are two assignments in total,and each assignment is graded on a 100-point scale. ●The final assessment is conducted in the form of a comprehensive report.Based on the course content,students are required to complete a comprehensive report related to the power market.The assessment content covers all course objectives. ●The continuous assessment score,final assessment score,and overall final grade are all evaluated on a 100-point scale.In the overall final grade,the weightings of the continuous assessment and final assessment are 0.2 and 0.8,respectively.The score distribution and weightings of each assessment component may be adjusted according to the teaching arrangement.
Reading list	<p>Reference books</p> <p>[1] Zhang Li (Ed.).<i>Introduction to Power Markets</i>.Beijing: China Machine Press,2016.</p> <p>[2] Yao Jiangan (Ed.).<i>Power Market Analysis</i>.Beijing: Higher Education Press,1999.</p> <p>[3] Zeng Ming et al.<i>Commercial Operation of the Power Industry and Power Markets</i>.Beijing: China Electric Power Press,1998.</p> <p>[4] Yu Erkang et al.<i>Power Markets</i>.Beijing: China Electric Power Press,1998.</p> <p>[5] Yao Jiangan et al.<i>Power Market Operation and Software Development</i>.Beijing: China Electric Power Press,2002.</p>
Data of last mendment	January 21,2026

Principle and Application of PLC

Module designation	Principle and Application of PLC
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Liu Shurong
Language	Chinese
Relation to curriculum	<p>The course "Principles and Applications of PLC" serves as a foundational course for Electrical Engineering and Automation majors. Through this course, students will master the distinctions and connections between relay-contactor control systems and programmable control systems; learn to select common low-voltage electrical equipment and PLC models; acquire the methods and steps for designing PLC control systems, as well as the fundamental knowledge of software and hardware design, installation, debugging, and control of PLC systems.</p> <p>The course is highly practical and applicable, and is one of the most widely used technologies in industrial fields. By integrating the characteristics of the major and the development trend of PLC control technology, it aims to cultivate students' engineering perspective and enhance their ability to identify, analyze, and design complex electrical engineering problems.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation Major students Type of teaching: Theoretical teaching and experimental teaching Teaching methods: Case method; Questioning method; Heuristic teaching Contact hour: 32 hours Including Theoretical teaching: 26 hours Experiment teaching: 6 hours Computer practice: 0 hours Size of class: 80-90</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours Contact hours = 32 hours Self-study hours = 58 hours</p>
Credit points	2.0 European credits 90
Required and recommended prerequisites for joining the module	Electronic Technique
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Make students understand and master the difference and connection between relay contactor control system and programmable control system.

	<p>2.Be familiar with and proficient in selecting programmable controllers and common low-voltage electrical equipment.</p> <p>3.Be familiar with and master the design methods of programmable control systems,as well as the knowledge of software and hardware design,installation,and debugging of programmable control systems.</p> <p>● Skill:</p> <p>1. Be capable of applying fundamental knowledge and theories of low-voltage electrical equipment,PLC,and electrical control to identify and evaluate relay contact control systems and PLC control systems,and to conduct effective decomposition and analysis with professional expertise.</p> <p>2.Based on the basic methods and steps of PLC control system design,the paper can select the common low-voltage electrical equipment and PLC models according to the technical indexes and control requirements,and make a reasonable design scheme for the design and improvement of PLC control system.</p> <p>3.The paper can use the means of experiment,according to the specific control index,select the reasonable route,design the feasible experiment scheme,and independently construct the hardware and software platform,correctly analyze the experimental phenomenon,and deeply study and improve whether the PLC control system meets the control index.</p> <p>● Competence:</p> <p>1.Possess core competencies in designing,programming,and debugging basic industrial automation control systems using PLC hardware and software.</p> <p>2.Master the engineering thinking of transforming the actual industrial control requirements into programmable logic control system and achieving reliable operation.</p>
Content	<p>A.Theoretical teaching(26 contact hours, 58 self-study hours)</p> <p>Chapter 1 Common low-voltage electrical appliances (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Structure,working principles,and applications of common low-voltage electrical appliances ● Diagrams and alphanumeric symbols of common low-voltage electrical appliances ● Proper and rational usage of low-voltage electrical appliances. <p>Chapter 2 Automatic control system of relay contactor (4 contact hours; 9 self-study hours)</p> <ul style="list-style-type: none"> ● Electrical control system diagram design; ● Fundamental principles of electrical control circuits; ● Common control circuits for electric motors; <p>Chapter 3 An Overview of Programmable Controller (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of PLC; ● Basic components of PLC;

	<ul style="list-style-type: none"> ● Working principles of PLC; ● Core components of S7-1200 PLC; ● Key features of S7-1200 PLC. <p>Chapter 4 System Configuration and Interface Module of S7-1200PLC (2 contact hours; 5 self-study hours)</p> <ul style="list-style-type: none"> ● Core components of the S7-1200 PLC system; ● Interface modules for the S7-1200 PLC; ● System configuration for the S7-1200 PLC. <p>Chapter 5 Instruction system of PLC (6 contact hours; 14 self-study hours)</p> <ul style="list-style-type: none"> ● Fundamentals of S7-1200PLC programming; ● Basic instructions of S7-1200 PLC. <p>Chapter 6 Design and Application of PLC Control System (6 contact hours; 14 self-study hours)</p> <ul style="list-style-type: none"> ● The components and procedures of PLC control system design; ● Design methodologies and techniques for PLC applications. <p>Part B.Experiment teaching(16 contact hours; 10 self-study hours)</p> <p>To help students better understand the fundamental principles of PLC control systems, master their analysis and design methodologies, and enhance practical skills, we will organize the following three representative experimental projects:</p> <p>Experiment 1: Basic Logic Instruction Experiment (2 hours)</p> <p>Experiment 2: PLC-Based Motor Forward and Reverse Control experiment (2 hours)</p> <p>Experiment 3: Simulation Control Experiment of Traffic Light Based on PLC-HMI (2 hours)</p>
Examination forms	Closed-book written exam
Study and examination Requirements	<ul style="list-style-type: none"> ● Students shall complete the after-class assignments independently. Being late, leaving early or unapproved absences are not permitted. ● The regular assessment accounts for 25%, consisting of three parts: unit assignments (45%), comprehensive course project (35%), and regular quizzes (20%). ● The laboratory assessment accounts for 10%, including experimental proposal (20%), experimental system setup (40%), and experiment report (40%). ● The final assessment (closed-book written examination) accounts for 60%.
Reading list	<p>1. Required books</p> <p>[1] Liao Changchu. "S7-1200PLC Programming and Application" (4th Edition). Beijing: Machinery Industry Press, 2021 (Chinese).</p> <p>2. Reference books</p> <p>1. Wang Yonghua. Modern Electrical Control and PLC Application Technology (4th Edition). Beihang University Press, 2016.</p> <p>2. Liu Huabo. "Programming and Application of Siemens S7-1200 PLC" (2nd Edition). Beijing: China Machine Press, 2020.</p>
Data of last amendment	December 18, 2025

Automation of Electric Power Systems

Module designation	Automation of Electric Power Systems
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Wang Hui
Language	Chinese
Relation to curriculum	<p>The course “Power System Automation” is an elective professional course for the Electrical Engineering and Automation major. Power system automation is a comprehensive technology that ensures the safe, high-quality, and economical operation of power systems. It involves the application of automatic control technology and information technology within power systems, making it a course that closely integrates theory with practice. Through this course, students will:</p> <p>Understand fundamental concepts of power system automation; Gain knowledge of foundational theories and practical applications of automation technologies in power system operation; Master the principles of widely used automation technologies in the power industry. The course cultivates students' innovative thinking and ability to comprehensively analyze power system automation-related issues using fundamental theoretical knowledge, laying a foundation for post-graduation careers in related professional fields.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Theoretical teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Contact hour: 24 hours Including</p> <p>Size of class: 80-100</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 60 hours</p> <p>Contact hours = 24 hours</p> <p>Self-study hours = 36 hours</p>
Credit points	1.5 European credits 2.0
Required and recommended prerequisites for joining the module	Power System Analysis, Analog Electronics, Digital Electronics, Electrical Machinery, Automatic Control Theory, Power Electronics

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Master the fundamental concepts,functions,and classifications of synchronous generator paralleling (quasi-synchronization,self-synchronization),automatic excitation control,power system frequency regulation and active power control,and grid dispatch automation. 2.Understand the primary components and operational workflows of automatic quasi-synchronization paralleling devices,excitation control systems,and automatic generation control (AGC) systems. 3.Master the fundamental architecture and functions of grid dispatch automation systems (e.g.,SCADA/EMS),including parallel connection criteria,excitation regulation characteristics,primary and secondary frequency regulation. ● Skill: <ol style="list-style-type: none"> 1.Able to identify system block diagrams and schematic diagrams for automatic synchronous operation,excitation systems,and AGC,and describe their signal flow and operational processes. 2.Capable of performing basic calculations and adjustments for key parameters such as paralleling closing lead time,excitation system stability parameters,and frequency regulation coefficients. ● Competence: <ol style="list-style-type: none"> 1.Capable of analyzing issues related to synchronous generator paralleling,automatic excitation control,power system frequency regulation and active power automatic regulation,as well as grid dispatch automation.
<p>Content (课程内容)</p>	<p>A.Theoretical teaching(24 contact hours; 36 self-study hours)</p> <p>Chapter 1 Introduction to Power System Automation and Development Trends (2 contact hours; 3 self-study hours)</p> <p>Chapter 2 Design Methods for Power System Automatic Devices and Systems,Principles of Hardware and Software (2 contact hours; 3 self-study hours)</p> <p>Chapter 3 Automatic Synchronous Generator Parallel Operation (4 contact hours; 6 self-study hours)</p> <p>Chapter 4 Excitation Control System for Synchronous Generators (6 contact hours; 9 self-study hours)</p> <p>Chapter 5 Automatic Regulation of Power System Frequency and Active Power(4 contact hours; 6 self-study hours)</p> <p>Chapter 6 Power System Dispatch Automation (4 contact hours; 6 self-study hours)</p> <p>Chapter 7 Substation and Distribution Network Automation Technology(2 contact hours; 3 self-study hours)</p>
<p>Examination forms</p>	<p>Open-book written exam</p>

09 Module Descriptions

<p>Study and xamination Requirements</p>	<ul style="list-style-type: none"> ● Students must complete their assignments independently after each class.Late arrivals,early departures,or unauthorized absences are not permitted. ●Regular performance accounts for 20% of the grade and includes four assignments. ●Regular coursework accounts for 20%,while the final assessment (Open-book written examination) accounts for 80%.
<p>Reading list</p>	<p>1.Required books</p> <p>[1] Li,Yansong.Power System Automation [M].2nd Edition.Beijing: China Electric Power Press,2022.</p> <p>[1] Li,Yansong.Power System Automation [M].1st ed.Beijing: China Electric Power Press,2014.</p> <p>[2] Meng,Xiangzhong.Power System Automation [M].Beijing: China Forestry Publishing House,2006.</p> <p>[3] Sun,Qiuyue.Power System Automation [M].Beijing: People's Posts and Telecommunications Press,2014.</p> <p>[4] Li Xianbin.Power System Automation [M].6th Edition.Beijing: China Electric Power Press,2014.</p> <p>[5] Wang Kui,Sun Ying.Power System Automation [M].3rd ed.Beijing: China Electric Power Press,2012.</p> <p>[6] Ding Jianyong,Hu Zhijian.Power System Automation [M].Beijing: China Electric Power Press,2015.</p>
<p>Data of last mendment</p>	<p>June 29,2025</p>

Special Topics in New Technologies of Electrical Engineering

Module designation	Special Topics in New Technologies of Electrical Engineering
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Zhou Jinghong
Language	Chinese
Relation to curriculum	Special Topics in New Technologies of Electrical Engineering is a distinctive specialty course for the Electrical Engineering and Automation major. It aims to broaden students' horizons and lay a foundation for understanding emerging technologies and new trends in the field of electrical engineering. Through this course, students will gain knowledge of advanced technologies, new research topics, and frontier applications in electrical engineering, as well as an understanding of advanced technologies and development trends in the electrical engineering field both domestically and internationally.
Teaching methods	Target students: Students majoring in Electrical Engineering Type of teaching: Theoretical teaching Teaching methods: Case method; Questioning method; Heuristic teaching Contact hour: 16 hours Including Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 70-80
Workload (incl. contact hours)	Total workload = 45 hours Contact hours = 16 hours Self-study hours = 29 hours
Credit points	1 European credits 1.5
Required and recommended prerequisites for joining the module	Power System Analysis
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. To understand emerging technologies and new developments in the field of electrical engineering, broaden perspectives, and gain insight into current application research hotspots and development trends in electrical engineering.</p> <ul style="list-style-type: none"> ● Competence: <p>1. To understand international development trends and research hotspots</p>

	in the field of electrical engineering, and to understand and respect cultural differences and diversity.
Content	<p>Theoretical teaching(16 contact hours; 29 self-study hours)</p> <p>Chapter 1: Applications of Artificial Intelligence in Electrical Engineering (4 contact hours; 7 self-study hours)</p> <ul style="list-style-type: none"> • Relevant theories of artificial intelligence (neural networks, genetic algorithms, etc.), related technical implementation methods, and applications of artificial intelligence technologies in electrical engineering. <p>Chapter 2: Energy Internet and New-Type Power Systems (2 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> • Basic knowledge of the Energy Internet, future development trends of the Energy Internet, and the concept and development trends of new-type power systems <p>Chapter 3: Power Markets and Carbon Trading Markets (6 contact hours; 10 self-study hours)</p> <ul style="list-style-type: none"> • Overview of power markets, the reform process of China's power system, the background and implementation pathways of "carbon peaking and carbon neutrality," carbon trading markets, and the interaction between power markets and carbon trading markets <p>Chapter 4: Virtual Power Plants and Integrated Energy Systems (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> • Power demand-side management and virtual power plants, participation of virtual power plants in power market transactions, and the concept and operation modes of integrated energy services
Examination forms	Comprehensive Report
Study and examination Requirements	<ul style="list-style-type: none"> • The continuous assessment accounts for 20% of the final grade. • The final assessment (comprehensive report) accounts for 80% of the final grade.
Reading list	<p>Reference books</p> <p>[1] Shen Qigong, Fang Yu, Zhou Zecun, Wang Dazhong. High Voltage Technology [M]. 4th Edition. China Electric Power Press, 2012. (Chinese) [2] Zhao Zhida. High Voltage Technology [M]. 4th Edition. China Electric Power Press, 2020. (Chinese)</p> <p>[1] Zhu Fuxi. Artificial Intelligence (3rd Edition). Beijing: Tsinghua University Press, 2017.</p> <p>[2] Zhu Fuxi. Basic Course of Artificial Intelligence. Beijing: Tsinghua University Press, 2011.</p> <p>[3] Zhu Yongqiang, Wu Qian. Energy Internet of Things. Beijing: China Machine Press, 2021.</p> <p>[4] Zhang Li. Introduction to Electricity Market. Beijing: China Machine Press, 2016.</p> <p>[5] Wang Peng, Wang Dongrong. A Guide to Virtual Power Plants. Beijing: China Machine Press, 2021.</p>
Data of last mendment	January 21, 2026

Smart Grid Communication Technology

Module designation	Smart Grid Communication Technology
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Pi Yuzhen
Language	Chinese
Relation to curriculum	"Smart Grid Communication Technology" is a specialized elective course offered in the Electrical Engineering and Automation program. Through this course, students will gain a fundamental understanding of modern communication technologies, learn about the history of various communication technologies, and grasp the development trends of modern communication technologies. Additionally, they will understand and master the principles of advanced communication network technologies and their applications in power grids.
Teaching methods	Target students: Electrical Engineering and Automation major students Type of teaching: Theoretical teaching Teaching methods: Case method; Questioning method; Heuristic teaching Contact hour: 16 hours Theoretical teaching: 0 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 100-120
Workload (incl. contact hours, self-study hours)	Total workload = 45 hours Contact hours = 16 hours Self-study hours = 29 hours
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Digital Signal Processing
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Understanding the Basic Concepts and Principles of Modern Communication. 2. Familiar with common modern communication technologies. ● Skill: <ol style="list-style-type: none"> 1. Explain the theoretical issues of information transmission, sending, and receiving in common communication methods.

	<p>2.Applying common modern communication technologies to analyze technical processes and methods in power system communication.</p> <p>● Competence:</p> <p>1.Enable students to understand the application prospects of communication technology in power systems.</p> <p>2.To cultivate students' awareness and preliminary ability to proactively learn and apply new technologies and methods to solve practical engineering problems,enhancing their sense of professional responsibility and innovative spirit.</p>
Content	<p>A.Theoretical teaching(16contact hours; 29 self-study hours)</p> <p>Chapter 1 Introduction (2 contact hours; 4 self-study hours)</p> <ul style="list-style-type: none"> ● Overview of Communication Technologies; ● Current Status of Power Communication Networks <p>Chapter 2 Fundamentals of Communication Technologies (4 contact hours; 8 self-study hours)</p> <ul style="list-style-type: none"> ● Signal Modulation and Coding; ● Error Detection and Correction for Data; ● Information Switching Techniques <p>Chapter 3 Common Communication Technologies in Power Grids (8contact hours; 14 self-study hours)</p> <ul style="list-style-type: none"> ● Power Line Carrier Communication; ● Fiber Optic Communication; ● Mobile Communication; ● Satellite Communication <p>Chapter 4 Computer Network Communication Technologies (2contact hours; 3self-study hours)</p> <ul style="list-style-type: none"> ● Basic Concepts and Applications of Computer Networks; ● TCP/IP Technology
Examination forms	Coursework
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students are required to complete the homework assigned after each class independently.Tardiness,early departure,and unapproved absences are not permitted. ● The coursework grade accounts for 30% of the final grade,comprising homework (20%) and periodic assessments (10%); the final report accounts for 70%.
Reading list	<p>1.Required books</p> <p>[1] Zhang Shue,Kong Yinghui,Gao Qiang.Communication Technology in Electric Power Systems (4th Edition) [M].Beijing: China Electric Power Press,2020.(in Chinese)</p> <p>2.Reference books</p> <p>[1]Zhang Hong.Digital Image Processing and Analysis[M].4th Edition.China Machine Press,2024.</p> <p>[2]Tang Liangrui.Smart Grid Communication Technology[M].Beijing: China Electric Power Press,2022.(in Chinese)</p>
Data of last mendment	Dec.,2025

Smart Microgrid Technology

Module designation	Smart Microgrid Technology
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Qu Nuoya
Language	Chinese
Relation to curriculum	<p>Microgrid Technology is a distinctive course for the major of Electrical Engineering and Automation. Through the instruction of this course, students will acquire systematic knowledge of microgrid engineering, understand the operational principles of distributed generation and energy storage systems, and master the fundamental theories underlying the operational control and regulation of control devices.</p> <p>Students will develop the ability to conduct preliminary design and planning for intelligent microgrid technologies, learn control and regulation strategies under various microgrid operating modes, and comprehend the coordination principles among diverse system components. Ultimately, this course aims to enhance students' proficiency in identifying, analyzing, and resolving complex electrical engineering problems related to the design, operation, and control of microgrids.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method; Heuristic teaching</p> <p>Theoretical teaching: 24 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 60 hours</p> <p>Contact hours = 24 hours</p> <p>Self-study hours = 36 hours</p>
Credit points	1.5 European credits 2
Required and recommended prerequisites for joining the module	Power System Analysis、Power Electronics、New Energy Power Generation Technology
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. To be able to rationally design the structural framework and topology of a simple microgrid system. 2. To be able to perform optimal dispatch for both grid-connected and islanded operations of a microgrid, based on its control modes and strategies. <ul style="list-style-type: none"> ● Skill:

	<p>To proficiently master a programming language and develop software for real-time monitoring systems.</p> <p>● Competence:</p> <ol style="list-style-type: none"> 1.To be able to configure protective relaying for microgrids. 2.To be able to adopt effective suppression measures for harmonic issues in microgrids.
Content	<p>A.Theoretical teaching(24 contact hours, 36 self-study hours)</p> <p>Chapter 1 Architecture and Classification of Microgrids (6 contact hours; 9 self-study hours)</p> <p>(1) Main teaching contents:</p> <ol style="list-style-type: none"> 1)Distributed generation equipment; 2) Energy storage devices; 3) Microgrid control system. (2) Requirements for knowledge points and ability points: <ol style="list-style-type: none"> 1) Knowledge points: Understand the characteristics of energy sources used in various distributed generation modes; grasp the operating principles of various distributed generation equipment (including photovoltaic power generation,wind power generation,fuel cells,etc.),the operating principles of energy storage equipment; understand the functions of each level in the microgrid control architecture; understand the ways of microgrid connection to distribution network and the classification of microgrids. 2) Ability points: Be able to rationally design the structural framework of a simple microgrid. (3) Key and difficult points of teaching: Key points: Operating principles of photovoltaic power generation equipment,wind power generation equipment,and energy storage equipment.Difficult points: Operating principles of grid-connected inverter equipment. <p>Chapter 2 Microgrid Control and Operation (8 contact hours; 12 self-study hours)</p> <p>(1) Main teaching contents:</p> <ol style="list-style-type: none"> 1) Microgrid operation modes (including grid-connected operation and islanding operation); 2) Microgrid control strategies (including master-slave control,peer-to-peer control and integrated control); 3) Inverter control modes (including P/Q control,U/f control and Droop control); 4) Three-state control of microgrid (including steady-state,dynamic-state and transient-state control). (2) Requirements for knowledge points and ability points: <ol style="list-style-type: none"> 1) Knowledge points: Master the basic concepts,principles and methods of three-state control of microgrids; master the control strategies of grid-connected inverters. 2) Ability points: Master the implementation methods of grid-connected and islanding operation control of microgrids; master the optimal dispatch methods for microgrid grid-connected and islanding operation. (3) Key and difficult points of teaching:

	<p>Key points: Implementation methods of microgrid grid-connected and islanding operation control.</p> <p>Difficult points: Inverter control methods.</p> <p>Chapter 3 Microgrid Monitoring System and Energy Management (4 contact hours; 6 self-study hours)</p> <p>(1) Main teaching contents:</p> <ol style="list-style-type: none"> 1) Microgrid monitoring system software; 2) Microgrid energy management. <p>(2) Requirements for knowledge points and ability points:</p> <ol style="list-style-type: none"> 1) Knowledge points: Understand common methods of microgrid load forecasting; understand the basic principles of optimal control; understand various common data and information to be monitored in microgrid engineering; master the programming framework of real-time monitoring software. 2) Ability points: Be proficient in at least one programming language and able to develop simple real-time monitoring system software; be able to complete simple power balance calculations for microgrids. <p>(3) Key and difficult points of teaching:</p> <p>Key points: Programming of simple industrial configuration software.</p> <p>Difficult points: Power balance calculation.</p> <p>Chapter 4 Microgrid Protection (4 contact hours; 6 self-study hours)</p> <p>(1) Main teaching contents:</p> <ol style="list-style-type: none"> 1) Relay protection issues related to microgrids; 2) Lightning protection and earthing protection of microgrids. <p>(2) Requirements for knowledge points and ability points:</p> <ol style="list-style-type: none"> 1) Knowledge points: Understand the impact of microgrid integration on distribution network relay protection; grasp lightning parameters and the working principles of lightning protection and earthing equipment; understand the protection strategies for microgrid operation; master the protection configuration methods when microgrids are connected to the distribution network. 2) Ability points: Be able to conduct relay protection configuration for microgrids. <p>(3) Key and difficult points of teaching:</p> <p>Key points: Differences between relay protection with microgrids and conventional distribution network protection; earthing protection measures.</p> <p>Difficult points: Protection configuration methods involving microgrids.</p> <p>Chapter 5 Microgrid Harmonic Control (2 contact hours; 3 self-study hours)</p> <p>(1) Main teaching contents:</p> <ol style="list-style-type: none"> 1) Passive filtering technology; 2) Active filtering methods. <p>(2) Requirements for knowledge points and ability points:</p> <ol style="list-style-type: none"> 1) Knowledge points: Understand the sources of harmonics and their impacts on power systems; understand the types and basic principles of various existing filtering devices.
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09 Module Descriptions

	<p>2) Ability points: Comprehend the basic principles of passive filters; comprehend the basic principles of active filters.</p> <p>(3) Key and difficult points of teaching: Key points: Operating principles of various active power filters. Difficult points: IGBT inverter control in power electronics technology.</p>
Examination forms	Final Project Report
Study and examination Requirements	<p>Students shall complete the assignments after each class independently. Late arrival, early departure or unapproved absence are not allowed. Regular grade accounts for 20%, including assignments and periodic assessments. Final report accounts for 80%.</p>
Reading list	<p>1. Required books</p> <p>1. Li Fusheng, Li Ruisheng, Zhou Fengquan. Microgrid Technology and Engineering Application. Beijing: China Electric Power Press, January 2013.</p> <p>2. Wang Chengshan, Xu Honghua, et al. Microgrid Technology and Application. Beijing: Science Press, March 2016.</p> <p>3. Zhang Jianhua, Huang Wei. Microgrid Operation, Control and Protection Technology. Beijing: China Electric Power Press, July 2010.</p> <p>4. Li Yilong, Cai Zhenxing, Zhang Zhongshan (Eds.). Control Technology of Intelligent Microgrid. Beijing: Beijing University of Posts and Telecommunications Press, August 2017.</p>
Data of last mendment	June 29, 2025

Professional Cognition Practice

Module designation	Professional Cognition Practice
Semester(s) in which the module is taught	3th semester
Person responsible for the module	Zhang Weijun
Language	Chinese
Relation to curriculum	<p>The Professional Familiarisation Placement constitutes a concentrated practical teaching activity for the Electrical Engineering and Automation programme. It serves as a crucial component in enhancing students' professional understanding, clarifying their academic direction, and boosting their motivation to learn.</p> <p>Through case-based teaching, and under the guidance of on-site engineers (placement supervisors) and placement tutors, students gain insight into the operational processes and safety protocols of power stations and substations. They acquire a foundational grasp of the core content and requirements of safety technical regulations for power generation facilities and substations, while developing report-writing skills and preliminary engineering communication abilities.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 20 hours Including</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 20 hours</p> <p>Self-study hours = 25 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Introduction To Electrical Engineering
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. Understand the technical standards, industrial policies, and legal regulations governing electricity enterprises, along with the responsibilities and scope of practice for electrical engineers.</p>

	<p>2. Comprehend the societal, health, safety, legal, and cultural implications of electricity generation, and recognise the social responsibilities inherent in electrical engineering practice.</p> <p>● Skill:</p> <p>1. Master the professional writing skills required to produce well-structured, clear internship reports that comply with industry standards and specifications.</p> <p>● Competence:</p> <p>1. Possess the ability to communicate and interact effectively with industry mentors or peers in specialised fields such as power generation and electrical equipment.</p> <p>2. Develop preliminary industry insight to identify and compare differences and development trends in electrical equipment both domestically and internationally.</p>
Content	<p>A. Practical teaching (20 contact hours; 25 self-study hours)</p> <p>Teaching Content:</p> <p>1. Practical lectures; (8 contact hours; 10 self-study hours)</p> <p>2. Thermal power plant fieldwork; (4 contact hours; 5 self-study hours)</p> <p>3. Substation simulation and on-site practical training. (8 contact hours; 10 self-study hours)</p>
Examination forms	Internship Report
Study and examination Requirements	<ul style="list-style-type: none"> ● Any of the following circumstances during the internship will result in a failing overall assessment: unauthorised absence of one day or more, failure to submit or late submission of the internship report without justification, or evidence of plagiarism in the deliverables. ● The overall assessment comprises a process evaluation (50%) and an outcome evaluation (50%).
Reading list 参考书目	<p>1. Required books 必读书目</p> <p>[1] GB 26860-2016. Electrical Safety Work Procedures: Electrical Components of Power Plants and Substations</p> <p>[1] Yang Yihan. Fundamentals of Power Systems [M]. Beijing: China Electric Power Press, 2007.</p> <p>[2] Xiao Yanping. Electrical Components of Power Plant Substations [M]. Beijing: China Electric Power Press, 2008.</p> <p>[3] Liu Rongli. Power Plant Mechanical Equipment [M]. Beijing: China Electric Power Press, 2007.</p>
Data of last mendment (修订日期)	June 29, 2025

Circuit Training

Module designation	Circuit Training
Semester(s) in which the module is taught	3th semester
Person responsible for the module	Lin He
Language	Chinese
Relation to curriculum	Circuit Training is a practical course for the major of Electrical Engineering and Automation. Through this course, students will gain an understanding of the working principle and internal wiring of multimeters, and be able to independently design and debug multimeters for DC current, DC voltage, AC voltage and ohmmeter ranges. The practical sessions can improve students' hands-on ability, as well as their ability to analyze and solve practical problems, laying a solid foundation for fostering their interest in professional learning and building confidence in engaging in professional work.
Teaching methods	<ol style="list-style-type: none"> 1. Lecture method 2. Case method 3. Discussion method 4. Blended teaching method 5. Experimental Method
Workload (incl. contact hours, self-study hours)	Total workload = 45 hours Contact hours = 20 hours Self-study hours = 25 hours
Credit points (ECTS)	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Circuit Theory
Module objectives/ intended learning outcomes	Learning outcomes: <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Understand the basic knowledge of electrical measurement. 2. Master the concepts of instrument accuracy and accuracy class. 3. Master the methods of range selection and setting. ● Skill: <ol style="list-style-type: none"> 1. Be proficient in operating common electrical instruments and meters. 2. Be familiar with the working principle of multimeters. 3. Learn the calculation methods for error, voltage-divider resistors and shunt resistors. 4. Master basic skills such as wiring, debugging and calibration proficiently. ● Competence:

09 Module Descriptions

	<ol style="list-style-type: none"> 1.Cultivate a rigorous,safety-conscious,and cooperative work attitude. 2.Develop the ability to write standardized technical practice reports. 3.Enhance awareness of national manufacturing strategies and engineering responsibility.
Content	<p>Practical Training (20 contact hours; 25 self-study hours)</p> <ol style="list-style-type: none"> 1.Knowledge Related to Multimeters (4 contact hours,4 self-study hours) 2.Installation,Calibration and Acceptance of Multimeter DC Current Ranges (3 contact hours,4 self-study hours) 3.Installation,Calibration and Acceptance of Multimeter DC Voltage Ranges (3 contact hours,4 self-study hours) 4.Installation,Calibration and Acceptance of Multimeter AC Voltage Ranges (3 contact hours,4 self-study hours) 5.Installation,Calibration and Acceptance of Multimeter Ohmmeter Ranges (3 contact hours,4 self-study hours) 6.Compilation of Internship Report (4 contact hours,5 self-study hours)
Examination forms	Practical assessment + Report submission
Study and xamination Requirements	<ul style="list-style-type: none"> ● Attendance is mandatory.Absences without approval will affect the final grade. ● The final grade consists of practical performance (80%) and practice report (20%). ● Grading scale: Excellent (90–100),Good (80–89),Satisfactory (70–79),Pass (60–69),Fail (below 60).
Reading list	<ol style="list-style-type: none"> 1.Zhang,J.H.(Ed.).(2018).Circuit Experiments and Computer Simulation.Beijing: China Electric Power Press. 2.Qiu,G.Y.(Ed.).(2022).Circuits (6th ed.).Beijing: Higher Education Press.
Data of last mendment	June 29,2025

Electronic Technology Practice

Module designation	Electronic Technology Practice
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lin He
Language	Chinese
Relation to curriculum	Electronic Technology Practice is an important practical teaching link for the major of Electrical Engineering and Automation. It enables students to initially get in touch with the reality of electronic product design and production, acquire basic knowledge and operational skills in electronic product manufacturing, cultivate students' work styles of abiding by labor discipline, emphasizing safe production, integrating theory with practice, and being scientific and rigorous, and improve their ability to analyze and solve problems, thus laying a good foundation for their future work and study.
Teaching methods	<ol style="list-style-type: none"> 1. Lecture method 2. Case method 3. Discussion method 4. Blended teaching method 5. Experimental Method
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours</p> <p>Contact hours = 40 hours</p> <p>Self-study hours = 50 hours</p>
Credit points (ECTS)	2.0
Required and recommended prerequisites for joining the module	Circuit Theory、 Analog Electronic Technology

09 Module Descriptions

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Understand the principles of electronic circuit design and PCB layout. 2.Master the characteristics and testing methods of common electronic components. ● Skill: <ol style="list-style-type: none"> 1.Able to use common electronic instruments and equipment proficiently. 2.Able to solder,assemble,and debug simple electronic products. 3.Able to design and fabricate simple printed circuit boards. 4.Be capable of completing the installation,debugging and performance index testing of simple electronic products. ● Competence: <ol style="list-style-type: none"> 1.Cultivate a rigorous,safety-conscious,and cooperative work attitude. 2.Develop the ability to write standardized technical practice reports. 3.Enhance awareness of national manufacturing strategies and engineering responsibility.
<p>Content</p>	<p>Practical Training (40 contact hours; 50 self-study hours)</p> <ol style="list-style-type: none"> 1.Electronic Instrument Operation and Component Identification (4 contact hours,6 self-study hours) 2.Printed Circuit Board (PCB) Design and Fabrication (4 contact hours,6 self-study hours) 3.Welding Technology and Process Standards (4 contact hours,6 self-study hours) 4.Installation,Fabrication and Debugging of Multivibrators (8 contact hours,8 self-study hours) 5.Installation,Fabrication and Debugging of Voltage Comparators (8 contact hours,8 self-study hours) 6.Installation,Fabrication and Debugging of FM Radios (8 contact hours,8 self-study hours) 7.Internship Report Writing(4 contact hours,8 self-study hours)
<p>Examination forms</p>	<p>Practical assessment + Report submission</p>
<p>Study and examination Requirements</p>	<ul style="list-style-type: none"> ● Attendance is mandatory.Absences without approval will affect the final grade. ● The final grade consists of practical performance (80%) and practice report (20%). ● Grading scale: Excellent (90–100),Good (80–89),Satisfactory (70–79),Pass (60–69),Fail (below 60).
<p>Reading list</p>	<ol style="list-style-type: none"> 1.Zhou,W.(2011).Electronic Circuit Design and Practice.National Defense Industry Press. 2.Lin,H.(2010).Fundamentals of Electronic Process Training.China Electric Power Press. 3.Shu,Y.,& Wen,C.(2015).Electronic Technology and Product Manufacturing.China Water & Power Press. 4.Tong,S.,& Hua,C.(2012).Fundamentals of Analog Electronics.Higher Education Press.

09 Module Descriptions

Data of last mendment	June 29,2025
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Microcontroller Application Technology Practice

Module designation	Microcontroller Application Technology Practice
Semester(s) in which the module is taught	6th Semester
Person responsible for the module	Du Bo
Language	Chinese
Relation to curriculum	<p>Microcontroller Application Technology Practice is a concentrated practical teaching activity for the Electrical Engineering and Automation major, serving as a crucial link in training students to apply their professional theoretical knowledge to solve real-world engineering problems. This course extends and develops the classroom instruction on Microcontroller Principles and Applications. Through practical tasks such as designing microcontroller application system solutions, constructing hardware circuits, developing system software programs, and conducting system debugging, students will master the steps and methods of preliminary microcontroller application system design. They will learn to accurately reference and utilize relevant technical materials to address engineering challenges, enhance their comprehensive problem analysis and resolution skills, cultivate engineering awareness in safety, reliability, and cost-effectiveness, and improve their ability to prepare engineering design documents and engage in communication and collaboration.</p>
Teaching methods	<p>Lecture method; Discussion method; Q&A guidance; Hands-on practice; Self-study by students</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours Contact hours = 40 hours Self-study hours = 50 hours</p>
Credit points	2.0 European credits 3.0
Required and recommended prerequisites for joining the module	Principles and Applications of Microcontrollers

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes</p> <ul style="list-style-type: none"> ● Knowledge: Through practical steps such as determining the design plan for a microcontroller application system, designing the system's hardware circuit, writing the system software program, and implementing system debugging, students will acquire the preliminary design procedures and methods for microcontroller application systems. ● Skill: Learn to correctly consult and utilize relevant technical documents to solve practical engineering problems, enhancing the ability to comprehensively analyze and address issues. ● Competence: Cultivate students' awareness of safety, reliability, and cost-effectiveness in engineering; enhance their ability to prepare engineering design documents and communicate effectively.
<p>Content</p>	<p>1. System scheme design (1 day) Based on the basic theoretical knowledge of microcontrollers, by consulting relevant materials and starting from system design requirements, propose a reasonable design scheme.</p> <p>2. Hardware circuit design and software program writing (4 days) The system hardware design includes the design of the minimum system of the microcontroller and the design of peripheral circuits, drawing hardware circuit schematics, and building hardware circuits. The requirement is to clarify the functions of the relevant chips, which can be found in the chip manual or other relevant materials. The selection of components should be based on evidence. The hardware circuit design must be reasonable and meet the technical specifications requirements. Complete the system software design and draw the program flowchart.</p> <p>3. System debugging (3 days) Debug the designed microcontroller application system to meet the design requirements of the problem.</p> <p>4. Writing a report (1 day) Submit a practical report with clear organization and drawing requirements that comply with national standards for graphics, symbols, lines, etc.</p> <p>5. Defense (1 day) Defend the entire design process, including system design scheme, system</p>

09 Module Descriptions

	hardware design,system software design,and debugging.
Examination forms	Process assessment,outcome assessment,and defense assessmen
Study and examination Requirements	<p>1.Students should independently complete project design content and are not allowed to be late,leave early,or absent without approval.</p> <p>2.Project assessment includes three parts: process assessment,outcome assessment,and defense assessment,with weights of 30%,30%,and 40% respectively.</p> <p>3.All grades are evaluated on a percentage scale,with 60 points being the passing score for this course.</p>
Reading list	<p>1.Required books</p> <p>[1] Yuan Dong 30 typical applications of 51 single-chip microcontroller (based on Proteus simulation) Beijing: Tsinghua University Press,2016</p> <p>[2] Zhang Yigang Principles and Interface Technology of Single Chip Microcomputer (C51 Programming) (3rd Edition) Beijing: People's Posts and Telecommunications Press,2021</p> <p>[3] Guo Tianxiang New Concept 51 Microcontroller C Language Tutorial: Introduction,Improvement,Development,and Expansion Guide (2nd Edition) Beijing: Electronic Industry Press,2018</p>
Data of last mendment	January 9,2026

Course Project on Power System Analysis

Module designation	Course Project on Power System Analysis
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Zhao Xu
Language	Chinese
Relation to curriculum	<p>The Course Project on Power System Analysis is a concentrated practical teaching activity for the major of Electrical Engineering and Automation. As a critical component of professional training, it aims to cultivate students' ability to apply specialized theoretical knowledge to solve practical engineering problems.</p> <p>Through this project, students will master the procedures and methodologies for power grid design; learn to properly utilize design manuals, codes, specifications, and relevant technical documents to address practical engineering challenges, thereby enhancing their comprehensive ability to analyze and solve problems; foster engineering consciousness centered on safety, reliability, and economy; and improve their competencies in literature retrieval, engineering design document compilation, communication, and self-directed learning.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 48 hours, Including</p> <p>Practical teaching: 48 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours</p> <p>Contact hours = 32 hours</p> <p>Self-study hours = 58 hours</p>
Credit points	2.0 European credits 3

<p>Required and recommended prerequisites for joining the module</p>	<p>Advanced Mathematics,Circuit Theory,Electrical Machines</p>
<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Be competent in conducting preliminary selection and economic comparison of power network connection schemes in compliance with national and industry design codes,and selecting a rational power network connection scheme; select transformer tap changers based on voltage regulation strategies and determine reactive power compensation measures for substations. 2. Be able to calculate the power flow distribution and short-circuit current of the designed power network in accordance with the principles,methodologies,and procedures of power system calculation. ● Skill: <ol style="list-style-type: none"> 1 .Optimal Schemes for Power Flow Calculation and Short-Circuit Current Calculation(Including Manual Calculation and MATLAB-Based Computational Implementation). ● Competence: <ol style="list-style-type: none"> 1. Be competent in compiling course design reports that meet specified requirements; be capable of presenting design-related issues,articulating design thinking and proposals,and engaging in effective communication and interaction with peers and instructors. 2. Be able to independently study relevant design codes and regulations,and foster a consciousness of lifelong learning.
<p>Content</p>	<p>Practical teaching(32 contact hours; 58 self-study hours)</p> <p>1.Preliminary Screening of Network Schemes</p> <ul style="list-style-type: none"> ● Review relevant reference literature and technical regulations,and analyze feasible network connection modes. ● Select two candidate schemes for economic comparison based on performance indicators of the power system,including power supply reliability and dispatch flexibility. <p>2.Determination of the Optimal Wiring Scheme for the Power Grid</p> <ul style="list-style-type: none"> ● Rationally select the voltage levels and electrical components for the preliminary candidate schemes. ● Calculate the one-time total investment and annual operating costs for each scheme respectively; conduct economic comparison using the payback period method; and finally determine one scheme as the optimal wiring scheme.

	<p>3.Power Flow Calculation and Short-Circuit Current Calculation for the Optimal Scheme</p> <ul style="list-style-type: none"> ● Select one operating mode from the four available options to conduct power flow calculation of the power grid,determine the transformer tap positions,and specify the reactive power compensation measures for substations. ● Select two short-circuit points for short-circuit current calculation. ● Compile the computer input data file,implement power flow and short-circuit current calculations using MATLAB programs,and output the calculation results.
Examination forms	Process Assessment,Outcome Assessment and Defense Assessment
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students are required to complete the design content independently.Lateness,early departure,or unapproved absence is strictly prohibited. ● The weightings of process assessment,outcome assessment,and defense assessment in the final comprehensive evaluation score are 0.3,0.3,and 0.4 respectively.
Reading list	<p>1. References</p> <p>[1]Meng Xiangping .Power System Analysis (3rd Edition).Beijing: Higher Education Press,2020.5</p> <p>[2]Power System Design Manual.Beijing: China Electric Power Press,June 1998</p> <p>[3]DL/T 5429-2009 Technical Code for Design of Electric Power System.Beijing: China Electric Power Press,2009.12</p> <p>[4]GBT 17468-2008 Guide for Selection of Power Transformers.Beijing.China Electric Power Press.2008.12</p> <p>[5]DL/T5222-2005 Technical Regulations for the Selection and Design of Conductors and Electrical Appliances.Beijing.China Electric Power Press.2005.7</p> <p>[6]SD 325-1989 Technical Guidelines for Voltage and Reactive Power in Power Systems.Beijing.China Electric Power Press.1989.8</p> <p>[7]DL/T5242-2010 Technical Code for Design of Reactive Power Compensation Devices in 35kV to 220kV Substations.Beijing: China Electric Power Press.2010.10</p> <p>[8] Electrical Design Manual for Power Engineering - Primary Electrical Systems.Beijing.China Electric Power Press.1998.10</p>
Data of last mendment	June 29,2025

Course Design of Power Electronics

Module designation	Course Design of Power Electronics
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Liang Chunhui
Language	Chinese
Relation to curriculum	<p>The Power Electronics Technology course project is a practical training activity for students majoring in Electrical Engineering and Automation. It plays a crucial role in developing students' ability to apply the theoretical knowledge they have learned to solve real-world engineering problems. The scope of this project includes the conceptual design of thyristor-based power electronic conversion systems, the calculation of circuit parameters, the design of system hardware, as well as Matlab simulation analysis. Through this course project, students are able to further consolidate and deepen their understanding of the basic knowledge, theories, and skills related to power electronics technology. They learn to independently carry out the basic design of such conversion systems, and to properly use design manuals, specifications, standards, and other technical resources to address practical engineering challenges. This process enhances their ability to analyze and solve problems comprehensively, as well as their skills in researching literature, preparing engineering design documents, communicating effectively, and engaging in self-study.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students Type of teaching: Theoretical teaching and experimental teaching Teaching methods: Case method; Questioning method Contact hour: 10 hours Including Theoretical teaching: 0 hours Practical teaching: 10 hours Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours Practical hours = 16 hours Self-study hours = 29 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Circuit theory, Analog electronic technology, Power electronic technology
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. Understand the basic principles and knowledge of power electronics technology, and master the structural characteristics of the four main types</p>

	<p>of power electronics conversion circuits.</p> <p>2.Understand the basic principles,calculation methods,and analysis techniques of the main power electronics conversion circuits.</p> <p>● Skill:</p> <p>1.Master the skills of using MATLAB software to simulate,debug,and analyze the power electronics systems that have been designed.</p> <p>2.Be able to independently learn relevant design specifications and methods,and develop a commitment to lifelong learning.</p> <p>● Competence:</p> <p>1.Based on the design objectives and in accordance with the design principles of power electronics circuits,it is possible to develop a detailed plan for the system under consideration and determine the appropriate circuit structure.</p> <p>2.It is possible to calculate the parameters of the main circuit and control circuit in accordance with the design principles,methods,and procedures of electrical engineering,to conduct a technical-economic evaluation,and to select the appropriate power electronic components based on the requirements of the design objectives.</p>
Content	<p>A.Practical teaching (16 class hours; 29 hours of self-study)</p> <p>1.Determine the control system design scheme by taking into account the technical specifications and given conditions of the course design (1 class hour; 5 hours of self-study).</p> <p>2.Design of the system's hardware circuit (2 class hours; 6 hours of self-study)</p> <p>3.Calculation of circuit parameters (2 class hours; 6 hours of self-study)</p> <p>4.Use the Matlab simulation software to perform simulation analysis of power electronics circuits (3 class hours; 6 hours of self-study)</p> <p>5.Draw the electrical schematic diagram and prepare a report on the course project (3 class hours; 6 hours of self-study)</p> <p>6.Defense presentation (1 class hour)</p>
Examination forms	Course Design Report and Defense
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students must complete the design tasks independently. ● The overall grade is determined by three components: process assessment (30%),outcome assessment (30%),and defense presentation (40%).
Reading list	<p>1.Required books</p> <p>[1] Liu Jinjun,Wang Zhaoan.Power Electronics Technology [M].6th edition.Beijing: China Machine Press,2022.(Chinese)</p> <p>2.Reference books</p> <p>[1] Huang Jun,Wang Zhao'an.Power Electronics Conversion Technology[M].3rd ed.Beijing: China Machine Press,2017.</p> <p>[2] Wang Zhao'an,Zhang Mingxun.Design and Application Manual of Power Electronic Equipment[M].3rd ed.Beijing: China Machine Press,2009.</p> <p>[3] Li Hong.Fundamentals of Modern Power Electronics Technology[M].Beijing: China Machine Press,2010.</p> <p>[4] Zhou Yuanshen.Power Electronics Technology and MATLAB</p>

09 Module Descriptions

	Simulation[M].2nd ed.Beijing: China Machine Press,2014.
Data of last mendment	January 21,2026

Design of Power System Relay Protection Course

Module designation	Design of Power System Relay Protection Course
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Huida duan
Language	Chinese
Relation to curriculum	<p>The relay protection course design in power systems serves as a core practical teaching component for Electrical Engineering and Automation majors, playing a pivotal role in developing students' ability to apply theoretical knowledge to real-world engineering challenges. During the design process, students must determine the maximum and minimum operating modes of power grids, calculate electrical fault quantities, establish protection configuration schemes, and perform relay protection setting calculations with sensitivity verification. They will learn to effectively utilize design manuals, standards, regulations, and technical documentation to address practical engineering issues, thereby enhancing their comprehensive problem-solving skills. The course also cultivates students' engineering awareness in safety, reliability, and cost-effectiveness, while improving their abilities in literature review, engineering documentation preparation, communication, collaboration, and self-directed learning.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 20 hours Including</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 16 hours</p> <p>Self-study hours = 29 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Power System Analysis, Power Plant Electrical Engineering, Power System Relay Protection
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Master the knowledge of protection configuration and setting calculation related to power system relay protection design, and determine the design objectives by integrating given materials and comprehensive design literature. 2. Master national and industry design specifications and standards for relay protection setting calculations and verification.

	<p>● Skill:</p> <p>1.Capable of conducting analysis for design tasks and proposing feasible design solutions based on design specifications.2.Able to draft course design documentation that meets requirements and produce protection schematic diagrams.</p> <p>● Competence:</p> <p>1.Capable of analyzing various factors affecting design objectives and technical solutions in accordance with engineering design methods and related technologies in the field of electrical engineering.Able to clearly articulate design concepts,proposals,or respond to questions.</p> <p>2.Able to design solutions for complex electrical engineering problems in accordance with the principles,methods,and procedures of electrical engineering design.</p>
Content	<p>A.Practical teaching(16 contact hours; 29 self-study hours)</p> <p>content of courses</p> <p>1. Analyze the power grid's operational mode and calculate the branch factor as required by the assignment. contact hours: 3; self-study hours: 6.</p> <p>2. Calculate the setting values for three-stage distance protection and determine its sensitivity according to the regulations. contact hours: 6; self-study hours: 10 .</p> <p>3. Conduct a comprehensive evaluation of the designed protection system.When any aspect fails to meet requirements,analyze potential consequences and propose remedial measures. contact hours: 3; self-study hours: 6 .</p> <p>4. Prepare the design documentation.Draw the schematic diagram and expanded diagram of the relay protection system. contact hours: 4; self-study hours: 7 .</p>
Examination forms	<p>The course assessment is mainly based on the achievement of the course objectives,and the assessment items include the process assessment,the achievement assessment and the defense assessment.The total score is weighted by 0.3,0.3 and 0.4.</p>
Study and xamination Requirements	<p>The overall evaluation grade will be deemed as failing if any of the following circumstances occur during the design process: unexcused absence from classes for 2 days or more,failure to submit or late submission of design outcomes,unexcused non-participation in the defense session,or plagiarism or similarity in the design outcomes.</p>
Reading list	<p>1. Required books</p> <p>[1] GBT50062-2008 Design Code for Relay Protection and Automatic Devices of Power Installations.Beijing: China Planning Press,2009</p> <p>2.Reference books</p> <p>[1]GBT 14285-2006 Technical Code for Relay Protection and Safety Automatic Devices.Beijing: Chnnina Planning Press,2006</p> <p>[2] Cui Jiawei et al.Setting Calculation of Relay Protection and Safety Automatic Devices in Power Systems.Beijing: China Electric Power Press,2006</p>

09 Module Descriptions

Data of last mendment	June 29,2025
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Practice of PLC Control System

Module designation	Practice of PLC Control System
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Liu Shurong
Language	Chinese
Relation to curriculum	<p>PLC control system practice is the concentrated practical teaching activity of electrical engineering and automation major, and is an important link to train students to use the professional theoretical knowledge to solve the engineering practical problems.</p> <p>This course addresses engineering challenges in PLC technology design. It equips students with the ability to develop tailored solutions aligned with professional development goals, plan system hardware and software functionalities, and construct experimental platforms for PLC control systems. Students will master PLC control system design methodologies and procedures, learn to refine designs through iterative experimentation, and enhance their problem-solving and analytical skills. The program also develops students' abilities in literature review, engineering documentation, communication, collaboration, and self-directed learning.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation Major students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 2 weeks</p> <p>Size of class: 80-90</p>
Credit points	2.0 European credits 3.0
Required and recommended prerequisites for joining the module	Principle and Application of PLC
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Proficient in software and hardware design methodologies for PLC control systems, with hands-on experience in system debugging and optimization. 2. Understand and master the writing format of the PLC control system practical report. ● Skill: <ol style="list-style-type: none"> 1. Capable of formulating rational PLC control system designs based on

	<p>control specifications,selecting appropriate PLC hardware and programming software,planning system functionalities,and developing customized PLC control systems with innovative solutions.</p> <p>2.Capable of summarizing,analyzing,and presenting final outcomes,and drafting standardized technical reports that align with the features of PLC control systems.</p> <p>3.During the design process,I can effectively communicate with team members,collaborate to advance the project,and present design outcomes clearly while responding to the defense advisor's questions.</p> <p>● Competence:</p> <p>1.To help students deeply understand and master the design principles of PLC control systems,thereby enhancing their engineering practice skills.</p> <p>2.Further cultivate students' rigorous and practical learning style,scientific attitude of pursuing perfection,and application innovation ability in the design.</p> <p>3.Through the practical application of programmable control systems,students will gain a deeper understanding of teamwork's significance and develop collaborative skills.</p>
Content	<p>Practical Teaching (40 contact hours; 50 self-study hours)</p> <p>● Practice Topic Selection</p> <p>1. An open topic selection mode is adopted for teaching.Each group shall independently determine the PLC design project to be completed.The group may choose one topic from those provided by the instructor or propose a self-designed topic.</p> <p>2.Self-designed topics can only be implemented after being reviewed and approved by the instructor.</p> <p>3.The topic shall have relatively complete functions,and should preferably be close to engineering practice to solve practical problems.It is required to have a certain depth and breadth,and reflect the characteristics of PLC control technology,the features of PLC control systems,and the wide integration with other practical engineering problems.</p> <p>4.The topic content shall be deeply open with sufficient workload.According to students' abilities,some design contents may be further deepened on the basis of completing basic tasks.</p> <p>● Practice Content</p> <p>1. Design the overall system scheme that meets the control requirements according to the practice task.</p> <p>2. Complete the selection of common low-voltage electrical equipment and hardware design of the PLC control system according to the system scheme,including motor selection,common low-voltage electrical equipment selection,PLC model selection,I/O allocation,main circuit hardware design,control circuit hardware design,etc.</p> <p>3. Complete the software design and monitoring interface design of the PLC control system according to the system scheme.</p> <p>4. Build the experimental platform of the PLC control system and continuously improve the design results.</p>

09 Module Descriptions

	5. Write the PLC technical report that meets the control requirements and complete the defense according to the design content.
Examination forms	The overall score consists of process assessment,achievement assessment,and defense assessment.
Study and xamination Requirements	1. Students work in groups,communicate and cooperate with each other to complete the whole practice process. 2.The overall score consists of process assessment,achievement assessment and defense assessment,among which: Process assessment accounts for 20% of the overall score; Achievement assessment accounts for 40% of the overall score; Defense assessment accounts for 40% of the overall score.
Reading list	1.Required books [1] Liao Changchu."S7-1200PLC Programming and Application" (4th Edition).Beijing: Machinery Industry Press,2021 (Chinese). 2.Reference books 1.Wang Yonghua.Modern Electrical Control and PLC Application Technology (4th Edition).Beihang University Press,2016(Chinese). 2.Liu Huabo."Programming and Application of Siemens S7-1200 PLC" (2nd Edition).Beijing: China Machine Press,2020(Chinese).
Data of last mendment	December 20,2025

Course Design for Electrical Engineering of Power Plants

Module designation	Course Design for Electrical Engineering of Power Plants
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Zhao Xu
Language	Chinese
Relation to curriculum	<p>The Course Design for Electrical Engineering of Power Plants serves as a concentrated practical teaching module for the program of Electrical Engineering and Automation. It constitutes a critical component for cultivating students' competence in applying specialized theoretical knowledge to address real-world engineering challenges.</p> <p>Throughout the design process, students are required to: Grasp the procedures and methodologies for the preliminary design of the electrical section of substations; Master the proper application of design manuals, codes, regulations, and relevant technical documents to resolve practical engineering problems, thereby enhancing their capabilities in comprehensive problem analysis and solution; Develop engineering consciousness centered on safety, reliability, and economy; Improve their skills in literature retrieval, engineering design documentation, communication, collaboration, and self-directed learning.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 32 hours Including</p> <p>Practical teaching: 32 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours</p> <p>Contact hours = 32 hours</p> <p>Self-study hours = 58 hours</p>
Credit points	2.0 European credits 3.0
Required and recommended prerequisites for joining the module	Power System Analysis, Electrical Engineering of Power Plants, Power System Relay Protection

<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Be capable of designing main electrical connection and station power supply connection schemes in accordance with the design principles and methods of electrical engineering. 2.Calculate short-circuit currents,impulse short-circuit currents and thermal effects of short-circuit currents at different voltage levels of substations under various operating modes. 3.Be able to rationally select conductors and electrical equipment,types and layout schemes of distribution devices by applying design manuals and regulations. ● Skill: <ol style="list-style-type: none"> 1.Design solutions to electrical engineering problems in accordance with the design principles,methods and procedures of electrical engineering. 2.Accurately apply technical standards and norms,and incorporate new technologies,new equipment and new processes in electrical engineering to design electrical systems,and demonstrate innovative consciousness in the design. ● Competence: <ol style="list-style-type: none"> 1.Demonstrate the ability to compile course design specifications that comply with academic and technical requirements.Be competent in presenting design rationales and proposals,and engage in effective academic communication with peers and instructors regarding design-related topics. 2.Be capable of independently acquiring knowledge of relevant design codes and regulations,thereby fostering consciousness of lifelong learning.
<p>Content</p>	<p>Practical teaching(32 contact hours; 58self-study hours)</p> <ol style="list-style-type: none"> 1. Electrical Main Connection and Station Power Supply <ul style="list-style-type: none"> ● In accordance with the design brief,and by referring to power engineering design manuals,codes,and specifications,reactive power compensation calculations are performed to determine the number and capacity of main transformers; the forms of electrical main connections for each voltage level of the substation are selected; and the voltage level,tapping scheme,and connection form of the station power supply are determined. 2. Short-Circuit Current <ul style="list-style-type: none"> ● Following the principles and methods of short-circuit calculation specified in power engineering design manuals,the periodic component of short-circuit current,impulse short-circuit current,and thermal effect of short-circuit current at each short-circuit point are calculated. 3. Conductors and Electrical Equipment <ul style="list-style-type: none"> ● Based on national and industrial design codes and standards,and integrating the application of new equipment and technologies,conductors and electrical equipment for each voltage level are selected and subjected

	<p>to relevant verification tests.</p> <p>4. Relay Protection and Automatic Devices</p> <ul style="list-style-type: none"> ● In compliance with the technical regulations for relay protection and safety automatic devices, relay protection configurations are carried out for main transformers, power lines, high/low-voltage shunt reactors, and shunt capacitors; relevant automatic devices are configured in accordance with the actual conditions of the designed substation. <p>5. Switchgear and Control Gear</p> <ul style="list-style-type: none"> ● In line with the technical regulations for high-voltage switchgear design, and considering the actual engineering conditions of the substation, switchgear for each voltage level is selected, and a layout scheme for high-voltage switchgear is formulated.
Examination form	Process Assessment, Outcome Assessment and Defense Assessment
Study and Examination Requirements	<ul style="list-style-type: none"> ● Students are required to complete the design content independently. Lateness, early departure, or unapproved absence is strictly prohibited. ● The weightings of process assessment, outcome assessment, and defense assessment in the final comprehensive evaluation score are 0.3, 0.3, and 0.4 respectively.
Reading list 参考书目	<p>1. References</p> <p>[1] DL/T5153-2014 Technical Code for Design of Plant Power Supply in Thermal Power Plants. Beijing: China Electric Power Press. October 2014.</p> <p>[2] NB/T 35044-2014 Code for Design of Plant Power Supply in Hydro-power Plants. Beijing: China Electric Power Press. October 2014.</p> <p>[3] DL/T5155-2016 Technical Code for Design of Plant Power Supply in 220kV to 1000kV Substations. Beijing: China Electric Power Press. August 2016.</p> <p>[4] DL/T5352-2018 Technical Code for Design of High Voltage Switch gear. Beijing: China Electric Power Press. July 2018.</p> <p>[5] Electric Power Engineering Design Manual - Electrical Primary Design of Thermal Power Plants. Beijing: China Electric Power Press. March 2018.</p> <p>[6] Electric Power Engineering Design Manual - Electrical Primary Design of Thermal Power Plants. Beijing: China Electric Power Press. March 2018.</p> <p>[7] Electric Power Engineering Design Manual - Electrical Secondary Design of Thermal Power Plants. Beijing: China Electric Power Press. March 2018.</p>
Data of last mendment	June 29, 2025

Practical English for Electrical Engineering

Module designation	Practical English for Electrical Engineering
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Yang Ming
Language	Chinese
Relation to curriculum	<p>Professional Foreign Language serves as a foundational course for the Electrical Engineering and Automation program. Offered after students complete university-level general English and relevant technical foundation courses, it extends the university English curriculum. Professional English training represents the final practical English component before students enter the workforce. The educational objectives of specialized foreign language instruction in higher education aim to equip students with both professional knowledge and an international perspective in electrical engineering. Students are expected to achieve basic proficiency in the specialized language, enabling fundamental communication and interaction in cross-cultural contexts. This requires not only mastery of specialized vocabulary but also enhanced reading comprehension and translation skills within the field. Students must understand both domestic and international developments in their field, necessitating comparative analysis of domestic and foreign expertise to assimilate advanced international knowledge. They should be able to draft official documents, engineering reports, and design proposals, and effectively communicate complex electrical engineering issues with industry peers and the public through oral presentations, written reports, and diagrams. Prepare to become internationally oriented professionals with a global perspective.</p> <p>Through this course, students will utilize foundational university English and specialized English knowledge acquired in this course. With reference materials, they will independently read and comprehend English-language literature and resources in their field. This enables mastery of common technical vocabulary, sentence structures, and grammar in scientific and technical English, along with translation techniques. Students are required to accurately interpret original texts to achieve precise translation of professional literature.</p> <p>This course adopts a student-centered approach to self-directed learning. Building upon existing foundational knowledge from specialized courses, it employs professional English training to enable students to meet the core learning objectives.</p>

Teaching methods	<p>Target students:Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods:Case method;Questioning method</p> <p>Contact hour: 20 hours Including</p>
Workload (incl.contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 20 hours</p> <p>Self-study hours = 25 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	University Public English and Related Technical Foundation Courses
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.Proficiently master specialized vocabulary related to the Electrical Engineering and Automation major; 2.Acquire the essential grammatical knowledge and background information required for reading foreign-language materials in Electrical Engineering and Automation; 3.Understand international trends,advanced technologies,cutting-edge equipment,and research hotspots within the electrical engineering field. ● Skill: <ol style="list-style-type: none"> 1.Able to read materials and literature related to electrical engineering and automation,verbally summarize technical proposals and reports,and achieve generally accurate pronunciation and intonation when reading aloud; 2.With dictionary assistance,proficiently read books and literature on electrical automation with an accuracy rate of 70% or higher; 3.Translate specialized literature related to the field at a rate of 200 to 300 words per hour; 4.Produce accurate,fluent translations that conform to Chinese linguistic conventions through back-translation and verification,presenting the final work in report format. ● Competence: <ol style="list-style-type: none"> 1.The ability to engage in continuous learning and self-directed study,possessiong linguistic and written communication skills for cross-cultural interaction,enabling basic communication and exchange on issues within the field of electrical engineering; 2.A mindset for self-directed learning and lifelong learning,capable of staying abreast of the latest theories,technologies,and international developments in electrical engineering.

09 Module Descriptions

<p>Content</p>	<p>A.Practical teaching(20 contact hours; 25 self-study hours) Teaching Content: 1.Coursework and translation of specialized English unit texts; (8 class hours; 10 self-study hours) 2.Translation of 1 English academic paper; (8 class hours; 10 self-study hours) 3.English text translation assessment; (2 class hours; 2.5 self-study hours) 4.English academic paper translation assessment and report.(2 class hours; 2.5 self-study hours)</p>
<p>Examination forms</p>	<p>Practical Training Report</p>
<p>Study and xamination Requirements</p>	<ul style="list-style-type: none"> ● Internship grades will not be counted for students who meet any of the following criteria during the internship period: <ul style="list-style-type: none"> - Unauthorized absence of 3 days or more - Failure to submit internship deliverables without justification - Plagiarism or substantial similarity in internship deliverables. ● Final grade assessment comprises: Process evaluation (30%), Deliverable evaluation (70%)。
<p>Reading list</p>	<p>1.Required books [1] Liu Ran,Jing Zhihua.English for Power Engineering [M].3rd ed.Beijing: China Electric Power Press,2013. 2.Reference books [1] Su Xiaolin,Gu Xueping.English for Electrical Engineering and Automation [M].Beijing: China Electric Power Press,2010.</p>
<p>Data of last mendment</p>	<p>June 29,2025</p>

Comprehensive Training of Power System Relay Protection

Module designation	Comprehensive Training of Power System Relay Protection
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Qu Nuoya
Language	Chinese
Relation to curriculum	<p>Comprehensive Practice in Power System Relay Protection is a centralized practical teaching activity for the major of Electrical Engineering and Its Automation. It serves as a critical link for training students to apply specialized theoretical knowledge in solving practical engineering problems.</p> <p>Through this practice, students will: master the commissioning methods of conventional protection systems; grasp the structure, working principles, and commissioning guidelines of microcomputer-based line protection devices, as well as their commissioning procedures and operational techniques; learn to correctly apply inspection standards, regulations for relay protection and power grid safety automation devices, and relay protection testing technologies to address practical engineering issues, thereby enhancing their comprehensive ability to analyze and solve problems; clarify the relationships between standardized operations, the "Two Tickets" (Operation Ticket, Work Ticket), and the "Three Measures" (Safety Measures, Organizational Measures, Technical Measures) and other relevant regulations; cultivate a sense of safe and reliable engineering practice; and improve their capabilities in literature retrieval, communication, and self-directed learning.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 32 hours Including (2 weeks)</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours</p> <p>Contact hours = 40 hours</p> <p>Self-study hours = 50 hours</p>
Credit points	2 European credits 3
Required and recommended prerequisites for joining the module	Professional foundation courses, specialisation courses, etc.
Module objectives/	Learning outcomes:

intended learning outcomes	<ul style="list-style-type: none"> ● Knowledge: To proficiently utilize the various modules of the relay test set, establish the test system, perform conventional protection tests, acquire test data, and analyze the test results. ● Skill: To formulate commissioning schemes based on relay protection principles and relay protection testing technologies, and to complete the commissioning of microcomputer-based line protection devices. ● Competence: 1. To conduct a comprehensive analysis of test data and results in accordance with the requirements of relay protection device regulations, and to propose solutions based on the analysis. 2. To correctly connect and operate the relay test set and microcomputer-based line protection devices in compliance with relevant technical standards and specifications for relay protection, and to identify and resolve common technical issues during the commissioning process.
Content	<p>A. Practical teaching (40 contact hours; 50 self-study hours)</p> <p>Teaching Content:</p> <p>1. Microcomputer Protection Testing Technology HD-30E Tester: Relay modules (current and voltage relays, impedance relays, time relays, power directional relays), fault simulation (simple fault simulation, multi-state simulation), impedance characteristics, line protection (distance setting values, zero-sequence current characteristics, integrated circuit transmission, line protection), programmable power supply (power source generator); WP30A Tester: Basic tests (general tests, state sequences, step variation), special tests (integrated circuit transmission test, zero-sequence protection, overcurrent protection, distance protection, search for impedance boundaries); AD431 Tester: Voltage/current measurement, time measurement, state sequences, integrated tests, line protection setting value verification, impedance/directional relays, conventional relay testing.</p> <p>2. Microcomputer Line Protection Devices Structure, working principles, and commissioning outlines of the RCS-900 series and CSL-103B microcomputer line protection devices.</p> <p>3. Inspection Regulations for Relay Protection and Power System Safety Automatic Devices In accordance with the Inspection Regulations for Relay Protection and Power System Safety Automatic Devices, and combined with on-site standardized guidelines, perform commissioning operations on the RCS-900 series and CSL-103B microcomputer line protection devices.</p>
Examination forms	Internship Report

Study and examination Requirements	<ul style="list-style-type: none"> Any of the following circumstances during the internship will result in a failing overall assessment: unauthorised absence of one day or more, failure to submit or late submission of the internship report without justification, or evidence of plagiarism in the deliverables. The overall assessment comprises a process evaluation (50%) and an outcome evaluation (50%).
Reading list	<p>1.Required books</p> <ol style="list-style-type: none"> 1.Technical and Operation Manual for RCS-900 Series EHV Transmission Line Complete Protection Equipment 2.Instruction Manual for CSL-103B Digital Transmission Line Pilot Current Differential Protection Device 3.Instruction Manual for PW,HD,AD Series Testers 4.Experimental Guide for Relay Protection 5.Comprehensive Training Guide for Relay Protection <p>2.Reference books</p> <ol style="list-style-type: none"> 1.Compilation of Power System Relay Protection Regulations.Beijing: China Electric Power Press,2014.11. 2.Testing Technology of Microcomputer-Based Protection for Power Grids.Beijing: China Water Conservancy and Hydropower Press,2005.03. 3.On-Site Standardized Operation Instructions for Power Supply Enterprises (Secondary Part).Beijing: China Electric Power Press,2007.10. 4.Example Analysis of Practical Skills Competition for Relay Protection.Beijing: China Electric Power Press,2014.06.
Data of last mendment	Jan.5,2026

Power System Comprehensive Test

Module designation	Power System Comprehensive Test
Semester(s) in which the module is taught	7th semester;
Person responsible for the module	Hui Wang,Xinda Li
Language	Chinese
Relation to curriculum	<p>Power System Comprehensive Test is a compulsory intensive practical course for the major of Electrical Engineering and Automation,embodying both instrumental and practical dimensions.In terms of its instrumental nature,firstly,the course is an important extension and application of theoretical courses such as Power System Analysis,Power System Automation,and Electrical Machinery.Its core aim is to consolidate and deepen students' understanding of relevant theoretical knowledge through practical operations,train them in experimental methods and operational skills,and enable them to master the operation principles and application scenarios of power system automation devices.Secondly,through systematic experimental training,students learn to formulate experimental plans independently,complete electrical wiring and debugging in accordance with technical standards,process experimental data scientifically,and write standardized experimental reports,thereby acquiring the practical capabilities required for engaging in engineering work in the electrical engineering field.Regarding its practical nature,firstly,the course emphasizes the cultivation of engineering literacy.In the experimental process,students are guided to abide by electrical engineering technical standards and specifications,develop safety awareness,quality awareness,and problem-solving abilities,and lay a solid foundation for addressing practical engineering issues in future work.Secondly,the course integrates team collaboration and ideological and political education elements.By conducting group experiments,students develop the ability to cooperate and coordinate in teams; through comparing domestic and foreign power system automation technologies and understanding the development direction of China's power industry,students establish correct outlooks on life and values,foster patriotic sentiments,and enhance their ideological and political quality.The core of practical education is to focus on the integration of theory and practice,and the all-round development of students' professional abilities and comprehensive qualities.Therefore,it is necessary to give full play to the practical characteristics of the course and achieve the organic unity of instrumental and practical dimensions.</p>

Teaching methods	<p>Target students: Electrical Engineering and Automation major students</p> <p>Type of teaching: Intensive practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 16 periods</p> <p>Theoretical teaching: 0 periods</p> <p>Experiment teaching: 16 periods</p> <p>Size of class: To be determined according to actual enrollment (4-5 students per group, 8 groups per class)</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 20 hours</p> <p>Self-study hours = 25 hours</p>
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Power System Analysis, Power System Automation, Electrical Machinery
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <p>● Knowledge:</p> <ol style="list-style-type: none"> 1. Master the basic principles and operating mechanisms of key power system equipment and automatic devices, including synchronous generators, excitation systems, speed control systems, and automatic reclosing devices. 2. Understand the basic concepts and analysis methods of power system steady-state and transient operation, such as power flow distribution, power characteristics, power limits, and transient stability. 3. Familiarize with electrical engineering technical standards and specifications related to power system experiments, and grasp the safety operating procedures and data measurement requirements of experimental equipment. 4. Learn the basic functions of power system dispatching automation, including telemetry, remote signaling, remote control, and remote adjustment. <p>● Skill:</p> <ol style="list-style-type: none"> 1. Be able to correctly install, wire, and debug power system automation experimental platforms and intelligent distribution network experimental systems in accordance with technical standards and specifications, and solve general technical problems independently. 2. Can design feasible experimental schemes based on experimental objectives, theoretical knowledge, and the characteristics of experimental equipment. 3. Master the methods of data measurement, screening, and processing in power system experiments, and be able to conduct comprehensive analysis of experimental information to draw reasonable and effective conclusions. 4. Be capable of writing standardized, logical, and complete experimental reports that meet technical documentation requirements.

	<p>5. Can cooperate effectively in team experiments, complete assigned tasks such as equipment operation, data reading, and phenomenon recording, and achieve collaborative completion of experimental objectives.</p> <p>● Competence:</p> <ol style="list-style-type: none"> 1. Cultivate engineering practice capabilities, including safety awareness, quality awareness, and standardized operation capabilities, to meet the requirements of practical work in the electrical engineering field. 2. Develop team collaboration and coordination capabilities, enabling students to assume different roles in a team and complete complex tasks through effective communication and cooperation. 3. Enhance the ability to analyze and solve practical engineering problems, and foster scientific thinking and innovative awareness in experimental design and data analysis. 4. Integrate ideological and political education to cultivate students' patriotic feelings, sense of social responsibility, and professional ethics, inspiring them to contribute to the development of China's power industry.
Content	<p>A. Practical Teaching (20 contact hours; 25 self-study hours)</p> <p>Unit 1 Start-up and Speed Regulation Experiment of Synchronous Generators</p> <p>1.1 Main content: Simulated start-up methods of synchronous generators; manual speed regulation of synchronous generators by microcomputer; automatic speed regulation of synchronous generators by microcomputer.</p> <p>1.2 Key and difficult points: Mastery of synchronous generator start-up procedures and speed regulation principles; standardized operation of speed control systems.</p> <p>Unit 2 Quasi-Synchronous Paralleling Experiment of Synchronous Generators</p> <p>2.1 Main content: Manual quasi-synchronous paralleling of synchronous generators; full-automatic quasi-synchronous paralleling of synchronous generators.</p> <p>2.2 Key and difficult points: Judgment of quasi-synchronous paralleling conditions; operation skills of paralleling control systems.</p> <p>Unit 3 Excitation Control Experiment of Synchronous Generators</p> <p>3.1 Main content: Start-up and extinction of exciter; adjustment of excitation current; influence of excitation regulation on generator operation.</p> <p>3.2 Key and difficult points: Principle and operation of excitation control systems; mastery of excitation adjustment methods.</p> <p>Unit 4 Regulation Characteristic Experiment of Synchronous Generators</p> <p>4.1 Main content: Positive regulation characteristics; zero regulation characteristics; negative regulation characteristics.</p> <p>4.2 Key and difficult points: Measurement and analysis of generator regulation characteristics; understanding of the influence of different regulation characteristics on system operation.</p>

	<p>Unit 5 Under-Frequency Load Shedding Experiment of Power Systems</p> <p>1.1 Main content: Principle of under-frequency load shedding; setting and adjustment of under-frequency load shedding parameters; experimental verification of under-frequency load shedding effects.</p> <p>1.2 Key and difficult points: Understanding of under-frequency load shedding principles; parameter setting and effect analysis.</p> <p>Unit 6 Steady-State Operation Experiment of One-Machine Infinite-Bus System</p> <p>6.1 Main content: Steady-state symmetric operation of single-circuit lines; comparison between symmetric operation of double-circuit lines and single-circuit lines; steady-state unbalanced operation of single-circuit lines.</p> <p>6.2 Key and difficult points: Analysis of power flow distribution under different operation modes; mastery of steady-state operation parameter measurement methods.</p> <p>Unit 7 Power Characteristic and Power Limit Experiment of Power Systems</p> <p>7.1 Main content: Measurement of power characteristics and power limits without excitation regulation; measurement with manual excitation regulation; measurement with automatic excitation regulation.</p> <p>7.2 Key and difficult points: Influence of excitation regulation on power characteristics; accurate measurement of power limits.</p> <p>Unit 8 Transient Stability Experiment of Power Systems</p> <p>8.1 Main content: Influence of short circuits on power system transient stability; research on measures to improve transient stability.</p> <p>8.2 Key and difficult points: Analysis of transient stability mechanisms; understanding of stability improvement measures.</p> <p>Unit 9 Operation Mode Experiment of Complex Power Systems</p> <p>9.1 Main content: Simulation of different operation modes of complex power systems; analysis of operation characteristics and parameter changes under various modes.</p> <p>9.2 Key and difficult points: Mastery of complex power system operation mode switching; analysis of operation parameter changes.</p> <p>Unit 10 Power System Dispatching Automation Experiment</p> <p>10.1 Main content: Familiarization with telemetry, remote signaling, remote control, and remote adjustment functions of dispatching automation systems; experimental operation and verification of related functions.</p> <p>10.2 Key and difficult points: Understanding of dispatching automation system functions; operation of experimental system functions.</p> <p>Unit 11 Experimental Report Compilation 第 11 单元 实验报告撰写</p> <p>11.1 Main content: Standard format and writing requirements of experimental reports; organization of experimental data, analysis of experimental phenomena, and summary of experimental conclusions.</p> <p>11.2 Key and difficult points: Logical organization of experimental reports; in-depth analysis of experimental results and theoretical connection.</p> <p>Unit 12 Ideological and Political Education</p>
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	12.1 Main content: Comparison of domestic and foreign power system automation technologies; development direction of China's power industry and talent demand; cultivation of patriotic sentiments and professional ethics.
Examination forms	Comprehensive assessment (practical operation + experimental scheme + experimental report + team collaboration)
Study and examination Requirements	<ul style="list-style-type: none"> ● Students shall abide by the laboratory safety regulations and experimental operation specifications, and complete experimental tasks on time. Being late, leaving early, or being absent without approval is not allowed (those who are absent for 2 days or more will have a failing grade). ● The total score (100 points) is composed of four parts corresponding to the course objectives, with the following weights: <ol style="list-style-type: none"> 1. Practical operation (Target 1): 40 points, assessing the proficiency of experimental installation, wiring, debugging, and problem-solving abilities. 2. Experimental scheme design (Target 2): 10 points, assessing the rationality and feasibility of the designed experimental scheme. 3. Experimental report (Target 3): 30 points, assessing the standardization, logic, completeness, and depth of analysis of the experimental report. 4. Team collaboration (Target 4): 20 points, assessing the coordination ability of team leaders, the completion of assigned tasks by team members, and the effectiveness of team cooperation. ● Plagiarism or copying of experimental reports is strictly prohibited; those who fail to submit or submit the report late without reason will have a failing grade.
Reading list	<p>2. Required books</p> <p>[1] Xiangping Meng, Yan Gao, Chief editors, Power System Analysis, Higher Education Press, 2004.</p> <p>[2] Xinyin Xiong, Chief editor, Electrical Part of Power Plants, China Electric Power Press, 2004.</p> <p>[3] Gang Wei, Chief editor, Introduction to Power Engineering, China Electric Power Press, 2005.</p> <p>[4] Hui Wang, Editor-in-Chief, Intelligent Distribution Network Comprehensive Experiment Guide, Self-compiled Teaching Material.</p> <p>[5] Mengyan Zhao, Hui Shi, Editor-in-Chief, Power System Comprehensive Experiment Guide, Self-compiled Teaching Material.</p> <p>2. Reference books</p> <p>[1] Yansong Li, Chief editor, Power System Automation (1st edition), China Electric Power Press, 2014.</p> <p>[2] Jianyong Ding, Zhijian Hu, Authors, Power System Automation, China Electric Power Press, 2015.</p> <p>[3] Ministry of Education, Guidance Outline of Subject's Critical Thinking Construction of Higher Education, May 2024.</p>
Data of last mendment	June 29, 2025

Comprehensive Experiments in High Voltage Engineering

Module designation	Comprehensive Experiments in High Voltage Engineering
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Pi Yuzhen
Language	Chinese
Relation to curriculum	Comprehensive Experiments in High Voltage Engineering is a crucial practical teaching component for the Electrical Engineering and Automation program. The course primarily covers the principles of high-voltage testing, experimental wiring configurations, operational procedures, analysis of experimental data, and essential safety precautions. Emphasis is placed on cultivating students' awareness of electrical safety and fundamental skills in high-voltage testing. It also guides and develops students' ability to analyze problems, enabling them to assess the condition of insulation through experimental methods.
Teaching methods	Target students: Electrical Engineering and Automation major students Type of teaching: Laboratory-Based Instruction Teaching methods: Case method; Questioning method Total Course Hours: 16 hours Experiment teaching: 16 hours Size of class: 200-300
Workload (incl. contact hours, self-study hours)	Total workload = 45 hours Contact hours = 20 hours Self-study hours = 25 hours
Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	High Voltage Engineering
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Methods of high voltage generation and their physical principles. 2. Electrical phenomena under high voltage (e.g., corona discharge, electrical breakdown, etc.). ● Skill: <ol style="list-style-type: none"> 1. Be able to select appropriate test equipment, construct proper experimental circuits, and conduct high-voltage experiments based on the principles of various experiments, while ensuring the safety of personnel and test apparatus. 2. Be able to correctly choose high-voltage measuring instruments or systems according to their characteristics to acquire experimental data.

	<p>3.Be able to draw reasonable and valid conclusions through comprehensive analysis of experimental data,and assess whether insulation defects exist and identify their types.</p> <p>● Competence:</p> <p>1.Proficiently operate high-voltage generating equipment,various measuring instruments,and partial discharge detection devices.</p> <p>2.To cultivate students' awareness and preliminary ability to proactively learn and apply new technologies and methods to solve practical engineering problems,enhancing their sense of professional responsibility and innovative spirit.</p>
Content	<p>A.Theoretical teaching(20 contact hours; 25 self-study hours)</p> <p>Experiment 1: Sphere Gap Discharge Test (4 hours; 5 self-study hours)</p> <p>Experiment 2: AC Withstand Voltage Test on Disc Insulators Using a Series Resonance System (4 hours; 5 self-study hours)</p> <p>Experiment 3: Measurement of Reference Voltage and Leakage Current of Metal-Oxide Surge Arresters (MOA) Using DC Method (4 hours; 5 self-study hours)</p> <p>Experiment 4: Determination of Dielectric Strength of Insulating Oil (4 hours; 5 self-study hours)</p> <p>Virtual Simulation Experiment: Virtual Simulation System for DC Electric Field Air Gap Discharge (4 hours; 5 self-study hours)</p>
Examination forms	Coursework
Study and xamination Requirements	<p>●Attend all lab sessions punctually; no unexcused absences,tardiness,or early departures are permitted.Obey the unified instructions of instructors and laboratory staff.Complete lab reports independently—plagiarism or falsification of data is strictly prohibited.</p> <p>●Grading breakdown: Unit tests account for 50%,virtual simulations for 20%,and lab reports for 30%.</p>
Reading list	<p>1.Required books</p> <p>[1]Zhao,Zhida (Chief Editor).High Voltage Engineering (3rd ed.).Beijing: China Electric Power Press,2015.</p> <p>[2]Wu,Guangning.High Voltage Engineering (National Planned Textbook for Undergraduate Education during the “12th Five-Year Plan” Period).Beijing: China Machine Press,2014.</p> <p>[3]Shen,Qigong,et al.High Voltage Engineering (4th ed.) (National Planned Textbook for Undergraduate Education during the “11th Five-Year Plan” and “12th Five-Year Plan” Periods).Beijing: China Electric Power Press,2012.</p> <p>2.Reference books</p> <p>[1] GB/T 50064–2014,Overvoltage Protection and Insulation Coordination for AC Electrical Installations</p> <p>[2] GB/T 50065–2011,Code for Design of Earthing for AC Electrical Installations</p> <p>[3] GB 11032–2010,Metal-Oxide Surge Arresters Without Gaps for AC Systems</p> <p>[4] GB/T 16927.1–1997,High-Voltage Test Techniques – Part 1: General</p>

09 Module Descriptions

	Test Requirements [5] GB/T 50064–2014, Code for Design of Overvoltage Protection and Insulation Coordination for AC Electrical Installations
Data of last mendment	Dec.,2025

Electrical Production Practice

Module designation	Electrical Production Practice
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Zhang Weijun
Language	Chinese
Relation to curriculum	<p>Production internship constitutes a comprehensive practical training programme undertaken by students after completing all theoretical courses and on-campus practical teaching modules.</p> <p>Through this internship, students shall master power plant safety regulations, comprehend electrical main wiring and plant power wiring principles, familiarise themselves with operational procedures and operating protocols for major equipment, gain proficiency in monitoring and adjusting key electrical equipment operating parameters, and learn principles and methods for incident handling. This experience deepens their understanding of the power industry and enhances practical capabilities.</p> <p>This placement is conducted under the supervision of both enterprise placement supervisors and university-based academic tutors.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 20 hours Including</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 135 hours</p> <p>Contact hours = 60 hours</p> <p>Self-study hours = 75 hours</p>
Credit points	3.0 European credits 4.5
Required and recommended prerequisites for joining the module	Power System Analysis, Electrical Components of Power Plants, Power System Relay Protection, High Voltage Technology, Power System Automation, etc.
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <p>● Knowledge:</p> <ol style="list-style-type: none"> 1. Be familiar with power plant operating procedures, operational protocols, and relevant laws and regulations. 2. Understand the social responsibilities inherent in electrical engineering practice and be able to reasonably evaluate the impacts of electricity generation processes on society, health, safety, legal compliance, and cultural considerations.

	<p>3.Comprehend the measures and significance of energy conservation and emissions reduction within power plant engineering projects.</p> <p>● Skill:</p> <ol style="list-style-type: none"> 1.Acquire relevant practical skills through operational procedures and hands-on tasks during work placement. 2.Develop professional competencies in problem analysis and resolution by participating in incident management. 3.Produce internship reports that meet regulatory standards and communicate effectively on technical matters encountered in the field. <p>● Competence:</p> <ol style="list-style-type: none"> 1.Demonstrated the ability to integrate theory with practice,providing a sound assessment of the environmental and social sustainability impacts arising from the implementation of electrical engineering projects. 2.Through group-based practical placements,cultivated a strong sense of teamwork and collaborative spirit,enabling effective fulfilment of team member roles and responsibilities whilst independently completing assigned tasks. 3.Familiarity with the professional nature and responsibilities of field engineers,demonstrating adherence to ethical standards in production practice; incident management has honed organisational coordination and adaptability,equipping the individual to assume leadership roles,manage operations,and respond to emergencies within multidisciplinary contexts.
Content	<p>A.Practical teaching(60 contact hours; 75 self-study hours)</p> <p>Teaching Content:</p> <ol style="list-style-type: none"> 1.Preparation for practical training; (4 contact hours; 5 self-study hours) 2.Practical training implementation; (52 contact hours; 65 self-study hours) 3.Preparation of practical training report.(4 contact hours; 5 self-study hours)
Examination forms	Internship Report
Study and xamination Requirements	<p>● Interns shall receive a failing grade in their overall assessment under any of the following circumstances: Failure to pass the safety regulations examination,resulting in exclusion from production sites; Accumulated unauthorised absences exceeding two days during enterprise-based practical training; Inability to comply with dress code requirements,resulting in exclusion from site access; Disregarding the instructions of supervising tutors,violating institutional or corporate regulations,or tampering with equipment without authorisation,causing significant disruption; Serious plagiarism of others' internship logs or reports.</p> <p>● The final assessment comprises: Practical process evaluation (30%) , Project outcome assessment (30%) , Defence presentation (40%)</p>
Reading list	<ol style="list-style-type: none"> 1.Required books <p>[1]GB 26860-2016.Electrical Safety Work Procedures: Electrical Components of Power Plants and Substations</p> <ol style="list-style-type: none"> 2.Reference books

09 Module Descriptions

	[1] Electrical Operating Procedures for Thermal Power Stations [2] Electrical Operating Procedures for 300MW Thermal Power Stations [3] Centralised Control Operating Procedures for 600MW Units [4] Li Qing, Energy Conservation and Emission Reduction Handbook for Thermal Power Stations, China Electric Power Press, January 2010
Data of last mendment	June 29, 2025

MATLAB Applications in Electrical Engineering

Module designation	MATLAB Applications in Electrical Engineering
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Ma Ying
Language	Chinese
Relation to curriculum	<p>MATLAB Applications in Electrical Engineering: Practical Training is a comprehensive, application-oriented technical practice course for undergraduate students majoring in Electrical Engineering and Automation. Through this course, students will master the use of MATLAB/Simulink and learn to build simulation models, enabling them to solve basic engineering problems with the aid of computer software.</p> <p>The course emphasizes enhancing students' problem-solving skills and software application proficiency. It aims to cultivate a rigorous, standardized, and practice-oriented scientific mindset that integrates theoretical knowledge with real-world engineering scenarios. This foundation prepares students for future challenges in engineering practice, applied research, and advanced academic study.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students</p> <p>Type of teaching: Theoretical teaching and experimental teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 10 hours Including</p> <p>Theoretical teaching: 0 hours</p> <p>Practical teaching: 10 hours</p> <p>Size of class: 30-40</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Practical hours = 20 hours</p> <p>Self-study hours = 25 hours</p>
Credit points	1 European credits 1.5
Required and recommended prerequisites for joining the module	Power System Analysis, Power System Protective Relaying
Module objectives/ intended learning outcomes	<p>Course Objectives and Competencies to Be Achieved Through This Course:</p> <p>1. Be able to understand the usage of relevant functions in MATLAB; be able to configure block parameters in Simulink, select appropriate modules according to given requirements, and design their parameters.</p>

09 Module Descriptions

	<p>2.Be able to construct models of power system operating conditions,design parameters,carry out simulation and debugging,analyze simulation results,and draw conclusions based on the analysis.</p> <p>3.Be able to analyze system data using the Powergui (Power System Graphical User Interface) block and generate report files.</p>
Content	<p>A.Practical teaching(20 contact hours; 25 self-study hours)</p> <p>Basic Simulink Operations: Running simulations,setting parameters,fundamental steps for model creation,simulation algorithms,and plotting capabilities(2 hours)</p> <p>Simulation Examples of MATLAB in Power System Fault Analysis(2 hours)</p> <p>Applications of MATLAB in Power System Stability Analysis(3 hours)</p> <p>Applications of MATLAB in Protective Relaying(3 hours)</p>
Examination forms	Oral Defense Assessment
Study and xamination Requirements	<p>•Students shall complete the training tasks independently.Those who have one of the following circumstances will get a **failing grade**: unexcused absence for 2 days or more,unexcused failure to submit or late submission of the training report,unexcused absence from assessment,etc.Process assessment (30%),achievement assessment (30%) and defense assessment (40%).</p>
Reading list	<p>Recommended Textbooks and Reference Books</p> <p>[1] Wang,J.(Ed.).(2018).MATLAB/Simulink simulation and applications in power systems.Xi'an: Xidian University Press.</p> <p>[2] Yu,Q.(Ed.).(2016).Modeling and simulation of power systems using MATLAB/Simulink.Beijing: China Machine Press.</p> <p>[3] Wang,Z.X.(Ed.).(2019).A tutorial on MATLAB modeling and simulation applications (2nd ed.).Beijing: China Machine Press.</p>
Data of last mendment	December 20,2025

Graduation Project

Module designation	Graduation Project
Semester(s) in which the module is taught	8th semester
Person responsible for the module	Duan Huida
Language	Chinese
Relation to curriculum	<p>The graduation project constitutes a concentrated practical teaching activity within the Electrical Engineering and Automation programme, serving as a crucial component in training students to apply their acquired theoretical knowledge to resolve real-world engineering challenges.</p> <p>Through this project, students acquire the methods and procedures for undertaking preliminary design of electrical systems in power plants and substations, power system planning and design, industrial and commercial power supply and distribution design, as well as research and development projects within the electrical engineering field. They develop the ability to correctly apply design manuals, codes, regulations, and relevant technical documentation, and to comprehensively utilise theoretical knowledge to analyse and resolve complex engineering problems. The project enhances their awareness and capacity for independent learning using modern learning tools, cultivates engineering principles such as safety, reliability, and economy, enhances skills in literature review, drafting engineering design documents, and communication.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Questioning method</p> <p>Contact hour: 240 hours Including</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 660 hours</p> <p>Contact hours = 240 hours</p> <p>Self-study hours = 420 hours</p>
Credit points	15.0 European credits 22
Required and recommended prerequisites for joining the module	Professional foundation courses, specialisation courses, etc.
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <p>1. Capable of integrating and applying electrical engineering knowledge</p>

	<p>systems to conduct systematic analysis, design solutions and evaluate complex engineering problems.</p> <p>2. Capable of tracking cutting-edge technologies and development trends within the profession, whilst possessing a profound understanding of the industry regulations and technical standards governing electrical engineering practice, along with its wide-ranging implications for society, health, safety, legal compliance, cultural considerations and environmental impact.</p> <p>● Skill:</p> <p>1. Demonstrate proficiency in employing advanced instruments, specialised software (such as CAD), scientific tools and other modern technological methods to support core engineering tasks including design, analysis, computation and debugging.</p> <p>2. Independently and systematically produce graduation project calculation manuals and specifications, draft engineering drawings, and communicate technical concepts and present outcomes with clarity and accuracy through oral, written and multimedia formats.</p> <p>● Competence:</p> <p>1. Demonstrate the ability to formulate and justify sound solutions for design tasks by comprehensively considering multiple constraints, investigate and resolve implementation issues, and exhibit innovative thinking throughout the process.</p> <p>2. Capable of independently locating, studying, and synthesising technical literature in both Chinese and foreign languages, applying advanced knowledge to resolve critical issues, and cultivating self-directed learning and continuous adaptation to industry developments.</p> <p>3. Capable of upholding sustainable development principles during scheme design and evaluation, objectively weighing the comprehensive impacts of engineering proposals, clarifying the relationship between engineering advancement and environmental protection, and making responsible engineering judgements.</p>
Content	<p>A. Practical teaching (240 contact hours; 420 self-study hours)</p> <p>Teaching Content:</p> <p>1. Conducting research, reviewing literature, and completing the project proposal; (16 contact hours; 28 self-study hours)</p> <p>2. Foreign language translation; (16 contact hours; 28 self-study hours)</p> <p>3. Defining design objectives, determining solutions, analysing and comparing options to select the optimal approach; (32 contact hours; 56 self-study hours)</p> <p>4. Design and implementation of research proposals within electrical engineering, including schematic design, analysis, calculations, and debugging; (96 contact hours; 168 self-study hours)</p> <p>5. Preparation of relevant drawings and design documentation; (48 contact hours; 84 self-study hours)</p> <p>6. Supervisor review and revision of graduation project content; (16 contact hours; 28 self-study hours)</p>

09 Module Descriptions

	7.Defence and assessment.(16 contact hours; 28 self-study hours)
Examination forms	Graduation Thesis or Graduation Project Specification and Drawings
Study and xamination Requirements	<ul style="list-style-type: none"> ● Completed independently by the student under the guidance of their supervisor. ● Overall assessment comprises: Supervisor's evaluation (35%) , Examiner's assessment (15%), Defence assessment (50%)
Reading list	<p>1.Required books</p> <p>[1] Graduation Project Guidance Manual for the Electrical Engineering and Automation Programme.</p> <p>[2] Relevant textbooks,literature,materials,and industry standards pertaining to topics within the field of electrical engineering.</p> <p>2.Reference books</p> <p>[1] Ministry of Electric Power Industry,General Institute of Electric Power Planning and Design (ed.).Handbook of Electric Power System Design.Beijing: China Electric Power Press,June 1998.</p> <p>[2] Cui Yuanchun (ed.).Handbook of Distribution Design (2nd ed.).Beijing: China Electric Power Press,March 2015.</p> <p>[3] Handbook of Electrical Design for Power Engineering: Primary Electrical Design for Thermal Power Plants.China Electric Power Press,March 2018.</p> <p>[4] Handbook of Electrical Design for Power Engineering: Secondary Electrical Design for Thermal Power Plants.China Electric Power Press.March 2018.</p>
Data of last mendment	June 29,2025

Power System Simulation Practice

Module designation	Power System Simulation Practic
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Yuan Yao; Zhang Longbin; Yang Ming
Language	Chinese
Relation to curriculum	<p>This internship course serves as a critical practical teaching component for the Electrical Engineering and Automation program. It constitutes a comprehensive simulation that integrates power plant simulation, power grid dispatching simulation, substation simulation, and electrical operation simulation into an organic whole via simulation technology, thereby enabling full-scope and full-process simulation of power generation, transmission, and substation production operations within the power system.</p> <p>Throughout the simulation process, students are trained to correctly apply electrical regulations, safety protocols, and fundamental knowledge of electrical safety to address practical issues arising from the production and operation of power generation, transmission, and substation systems in the power grid. This aims to enhance their capabilities in comprehensive problem analysis and resolution. The group operation module of the power plant simulation fosters students' robust team consciousness and collaborative spirit, equipping them to assume roles as system staff and responsible personnel in interdisciplinary teams comprising Electrical Engineering and Automation and Power Engineering majors. Additionally, it cultivates their ability to respond to emergencies, as well as to communicate and interact effectively. By adhering to academic norms to compose electrical engineering internship reports, students lay a solid foundation for further academic pursuits and future practical engagement in the field of electrical engineering.</p>
Teaching methods	<p>Target students: Students majoring in Electrical Engineering</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Heuristic method</p> <p>Contact hour: 32 hours Including</p> <p>Practical teaching: 32 hours</p> <p>Experiment teaching: 0 hours</p> <p>Computer practice: 0 hours</p> <p>Size of class: 70-80</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 90 hours</p> <p>Contact hours = 32 hours</p> <p>Self-study hours = 50 hours</p>
Credit points	2.0 European credits 3.0

<p>Required and recommended prerequisites for joining the module</p>	<p>Power System Analysis,Electrical Engineering of Power Plants</p>
<p>Module objectives/ intended learning outcomes</p>	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1.By using the substation simulation system,students can learn about the composition of substations,the structure,parameters and functions of electrical equipment,and cultivate their ability to execute operation tickets as well as their skills in fault analysis and abnormal handling. 2.Through the electrical operation physical simulation practice,one can master the composition of the electrical part of the power plant,the functions and operation methods of the main equipment,the principles of control circuits and protection circuits,and possess the ability to operate electrical systems. 3.Through the digital simulation practice of power plants,students can master the safety regulations of power plants and cultivate their working experience in the normal operation of the power plant's turbine-boiler-electricity system and their ability to handle faults. ● Skill: <ol style="list-style-type: none"> 1.Through the teacher's explanation,students initially master the basic knowledge of power laws and regulations,safety procedures and power safety,establish a rigorous,pragmatic and dedicated working attitude,and cultivate students' engineering awareness,quality and team spirit. 2.By writing internship reports,students' ability to prepare engineering documents is cultivated. ● Competence: <ol style="list-style-type: none"> 1.Master the laws and regulations of the power industry,safety procedures and basic knowledge of power safety,establish a rigorous,pragmatic and dedicated work attitude,and be able to communicate and exchange effectively with classmates and teachers. 2.Be capable of independently learning relevant design norms and regulations,and cultivate a lifelong learning awareness.
<p>Content</p>	<p>Practical teaching(40 contact hours; 50 self-study hours)</p> <ol style="list-style-type: none"> 1.Power grid dispatching simulation internship <ul style="list-style-type: none"> ● Proficient in the power grid dispatching simulation training system; simulation training for normal operations in power grid dispatching; simulation training for fault simulation and fault handling; simulation operation and handling of abnormal situations in power grid dispatching; simulation training for setting and switching of relay protection and automatic devices in power grid operation . 2.Substation Simulation Practice <ul style="list-style-type: none"> ● Substation safety regulations and main wiring of substations; keyboard usage and toolbar functions; operations such as voltage

	<p>checking,tagging,setting up barriers,and rotating primary equipment; normal operations,inspection of primary and secondary equipment,simulation setting and handling of faults and abnormalities; fault setting and analysis of protection action conditions; inspection of electrical equipment; procedures for line switching operations; procedures for busbar power on/off operations; basic knowledge of power safety.</p> <p>3.Electrical Operation Physical Simulation Practice</p> <ul style="list-style-type: none"> ● Generator-transformer Group Protection Circuit; Line Switching Operation; Microcomputer Protection Device Setting; Line Control Circuit and Signal Circuit (Part One); Line Control Circuit and Signal Circuit (Part Two). <p>4.Digital Simulation Practice of Power Plant</p> <ul style="list-style-type: none"> ● Production process of thermal power plant; Safety regulations of power plant; Electrical part of sliding parameter cold start-up of unit; Introduction of various electrical subsystems,such as power supply to DC bus,how to put protection plates into operation in relay protection system,how to supply power to high and low voltage plant power system,etc.; Boiler part of sliding parameter cold start-up of unit; Introduction of various boiler subsystems; Steam turbine part of sliding parameter cold start-up of unit; Introduction of various steam turbine subsystems; Fault setting and analysis.
Examination forms	Process Assessment,Outcome Assessment and Defense Assessment
Study and xamination Requirements	<ul style="list-style-type: none"> ● Students are required to complete the design content independently.Lateness,early departure,or unapproved absence is strictly prohibited. ● The weightings of process assessment,outcome assessment,and defense assessment in the final comprehensive evaluation score are 0.3,0.3,and 0.4 respectively.
Reading list	<p>1. References</p> <p>[1]Li Guoqing (Ed.).Operation and Simulation of Power Grid and Substation.China Electric Power Press,2009.12.</p> <p>[2]Yue Haifang (Ed.).Electrical Operation Practice Guide.Self-compiled Textbook.</p> <p>[3]Yue Haifang (Ed.).Substation Simulation Practice Guide.Self-compiled Textbook.</p> <p>[4]Zhao Mengyan (Ed.).Power Grid Dispatching Simulation Operation Guide.Self-compiled Textbook.</p> <p>[5]Yuan Yao (Ed.).Power Plant Simulation Practice Guide.Self-compiled Textbook.</p>
Data of last mendment	June 29,2025

Training of Electric Power Industry Safety Code

Module designation	Training of Electric Power Industry Safety Code
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Xing Shun Tao
Language	Chinese
Relation to curriculum	<p>Training on the Code of Practice for Safety in Electric Power Work is a concentrated practical teaching activity for the major of Electrical Engineering and Automation. It is a compulsory practical link before students participate in production practice.</p> <p>Through the training, students can master the basic electrical safety requirements for staff in electric power production units and workplaces, and meet the minimum requirements for internships in power plants and substations, so as to ensure the safety of students during internships in electric power production units and workplaces.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students</p> <p>Type of teaching: Experimental teaching</p> <p>Teaching methods: Case method; Heuristic method</p> <p>Contact hour: a week</p> <p>Size of class: 80-90</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 20 hours</p> <p>Self-study hours = 25 hours</p>
Credit points	1 European credits 1.5
Required and recommended prerequisites for joining the module	<p>High Voltage Technology;</p> <p>Electrical Engineering of Power Plants</p>
Module objectives/ intended learning outcomes	<p>Course Objectives and Competencies to Be Achieved Through This Course: (Through learning this course, the objectives and abilities to be achieved are as follows:)</p> <p>Objective 1: Be familiar with the national and power industry standards and safety regulations, master various basic electrical safety requirements. Objective 2: Through case study, cultivate students' awareness of cherishing life, and enable them to treat the operation and maintenance of power equipment scientifically and conscientiously.</p>

09 Module Descriptions

Content	<p>A.Theoretical teaching(20 contact hours; 25 self-study hours)</p> <p>1.Code of Practice for Safety in Electric Power Work Scope of application,operation requirements,safety organizational measures,safety technical measures,operation of electrical equipment,safety measures for line work,live working,inspection and maintenance of electrical machines,work on electrical equipment,electrical tests.</p> <p>2. Case Teaching Various typical cases of electrical safety.</p>
Examination forms	Safety Code Examination,released on Xuexitong.
Study and xamination Requirements	The course assessment aims mainly to evaluate the achievement of course objectives.Assessment items are divided into Objective 1 and Objective 2 according to the course objectives,with weights of 0.6 and 0.4 respectively in the overall score.
Reading list	<p>Recommended Textbooks and Reference Books</p> <p>[1] GB 26860-2011 Safety Code of Electric Power Work - Electrical Section of Power Plants and Substations.</p>
Data of last mendment	December 20,2025

Practice in Scientific and Technological Writing and Literature Retrieval

Module designation	Practice in Scientific and Technological Writing and Literature Retrieval
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Ma Ying
Language	Chinese
Relation to curriculum	<p>Practice in Scientific and Technological Writing and Literature Retrieval is a concentrated practical teaching activity for the major of Electrical Engineering and Its Automation. Through systematic training, students will master the basic knowledge of literature retrieval, understand commonly used domestic and international literature retrieval tools and their application methods, and be able to proficiently use such tools to search and obtain information. They will also develop the ability to sort out, classify, screen, extract and condense information, acquire cutting-edge theoretical and technical information in the field of electrical engineering, and lay a solid foundation for completing their graduation design and engaging in scientific research of this major in their future careers.</p> <p>The content of this practice includes training students to retrieve literature resources via online databases such as CNKI and Wanfang to develop their information-acquisition ability; guiding them to process and organize retrieved information and use literature resources appropriately under the guidance of academic norms to enhance their awareness of intellectual property rights and academic ethics; conducting in-depth study on literature reviews to improve their ability to write literature reviews in the proposal for graduation design; helping them master the process of graduation design and the writing requirements for graduation theses, and understand the defense procedures and key notes for graduation theses. In this way, students will be equipped with the comprehensive ability to high-quality complete all links including graduation design, thesis writing and thesis defense.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation programme major students</p> <p>Type of teaching: Practical teaching</p> <p>Teaching methods: Case method; Heuristic method</p> <p>Contact hour: 20 hours Including</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours</p> <p>Contact hours = 20 hours</p> <p>Self-study hours = 25 hours</p>

Credit points	1.0 European credits 1.5
Required and recommended prerequisites for joining the module	Relevant Professional Courses for the Major of Electrical Engineering and Its Automation
Module objectives/ intended learning outcomes	<p>Learning outcomes:</p> <ul style="list-style-type: none"> ● Knowledge: <ol style="list-style-type: none"> 1. Able to retrieve literature resources through online databases such as CNKI and Wanfang, and integrate the retrieved literature to use it appropriately under the guidance of academic norms. 2. Able to conduct research on literature reviews and analyze academic papers in combination with the writing requirements for literature reviews and graduation theses, and master the procedures and key notes for thesis defense. ● Skill: <ol style="list-style-type: none"> 1. Be able to compile official documents in a standardized manner, draw design drawings, and write design specifications, calculation sheets and reports; conduct effective communication and exchanges with peers in the power industry and the public by means of oral presentations, written documents, charts and other forms. 2. Be able to recognize the necessity of continuous exploration and learning against the backdrop of social and power industry development, and have the awareness of independent learning and lifelong learning. ● Competence: <ol style="list-style-type: none"> 1. In view of the strong practicality of this course, a variety of teaching methods such as computer operation practice, case analysis, students' self-evaluation and interactive discussion should be fully adopted in classroom teaching. Meanwhile, teaching tools including multimedia courseware should be integrated to fully apply literature retrieval methods to students' hands-on retrieval practice. 2. In light of the professional characteristics and learning needs of students, targeted practical training in scientific and technological writing should be strengthened.
Content	<p>A. Practical teaching (20 contact hours; 25 self-study hours)</p> <p>Teaching Content:</p> <ol style="list-style-type: none"> 1. Literature Retrieval Methods; Literature Retrieval Training (8 class hours; 10 self-study hours) 2. Information Extraction from Literature; Citation Norms for Academic Works (8 class hours; 10 self-study hours) 3. Thesis Proposal and Literature Review; Literature Review Analysis (2 class hours; 2.5 self-study hours) 4. Graduation Design Process, Writing Methods and Training for Graduation Thesis (2 class hours; 2.5 self-study hours)

09 Module Descriptions

Examination forms	Practical Training Report
Study and examination Requirements	<ul style="list-style-type: none"> ● Internship grades will not be counted for students who meet any of the following criteria during the internship period: <ul style="list-style-type: none"> - Unauthorized absence of 3 days or more - Failure to submit internship deliverables without justification - Plagiarism or substantial similarity in internship deliverables. ● Final grade assessment comprises: Process evaluation (30%) , Deliverable evaluation (70%)。
Reading list	<p>1.Required books 必读书目</p> <p>[1]Huang,Junzuo (ed.).Literature Retrieval and Scientific Paper Writing [M].(3rd ed.).Beijing: China Petroleum Press,2018.</p> <p>[2]Zhang,Meifang & Li,Zhenhua (eds.).Literature Retrieval and Thesis Writing [M].Beijing: Tsinghua University Press,2018.</p> <p>[3]Ji,Jiuming (ed.).Guide to Literature Retrieval and Knowledge Discovery [M].Shanghai: East China University of Science and Technology Press,2018.</p> <p>[4]Oliver,Paul.A Student Guide to Academic Integrity [M].Beijing: Peking University Press,2007.</p>
Data of last mendment	June 29,2025

New Energy Generation and Comprehensive Utilization of Energy

Module designation	New Energy Generation and Comprehensive Utilization of Energy
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Yang Ming
Language	Chinese
Relation to curriculum	<p>This course is a compulsory subject for electrical engineering majors and is a course that emphasizes the integration of theory and practice. In order to promote the development of new energy technologies, there is an urgent need to accelerate the dissemination of knowledge related to new energy technologies and the cultivation of relevant talent. Through this course, students will gain an understanding of China's current energy situation and the development status of new energy in China. They will master the basic principles of solar photovoltaic power generation and the composition of its system, deepen their understanding of China's wind energy resources and the basic principles of wind power generation, and gain a deeper understanding of the utilization status of biomass resources, which are the most widely distributed, while grasping the basic principles of biomass power generation. Students will also master the basic principles and application status of geothermal power generation and tidal energy power generation, as well as the basic principles of fuel cells and their various forms of fuel cell applications and mechanisms.</p>
Teaching methods	<p>Target students: Electrical Engineering and Automation major students Type of teaching: Theoretical teaching Teaching methods: Case method; Heuristic method Contact hour: 16 hours Including Theoretical teaching: 0 hours Practical teaching: 0 hours Size of class: 80-100</p>
Workload (incl. contact hours, self-study hours)	<p>Total workload = 45 hours Theoretical hours = 16 hours Self-study hours = 29 hours</p>
Credit points	1 European credits 1.5
Required and recommended prerequisites for joining the module	Power Electronics Technology, Analog Electronics Technology

Module objectives/ intended learning outcomes	<p>Course Objectives and Competencies to Be Achieved Through This</p> <p>1.This course will help students understand China's current energy situation and the development status of new energy in China.They will master the basic principles of solar photovoltaic power generation and the composition of its system,deepen their understanding of China's wind energy resources and the basic principles of wind power generation,and gain a deeper understanding of the utilization status of biomass resources,which are the most widely distributed,while grasping the basic principles of biomass power generation.Students will also explore alternative solutions through literature research,focusing on solar,hydropower,and wind energy technologies.</p> <p>2.Students will be able to build models of the power system's operating state,design parameters,conduct simulation debugging,analyze the simulation results,and draw conclusions.They will master the basic principles and application status of geothermal power generation and tidal energy power generation,understand distributed energy utilization and control technologies,as well as nuclear power generation and application technologies.Additionally,students will gain knowledge of the basic principles of fuel cells,their various forms,and the specific applications and mechanisms of fuel cells.</p>
Content	<p>A.Theoretical teaching(16 contact hours ; 29 self-study hours)</p> <p>Overview of Energy(1 hours)</p> <p>Solar Energy and Its Utilization(2 hours)</p> <p>Wind Energy and Wind Power Generation(2 hours)</p> <p>Tidal Energy and Tidal Power Generation(3 hours)</p> <p>Marine Energy and Various Power Generation Technologies(4 hours)</p> <p>Geothermal Energy and Its Utilization(2 hours)</p> <p>Biomass Energy and Its Utilization(2 hours)</p>
Examination forms	<p>Oral Defense Assessment</p>
Study and xamination Requirements	<p>The assessment consists of regular assessments,final assessments,and overall evaluation scores,all using a percentage-based grading system.In the overall evaluation,the weights for regular assessments and final assessments are 0.2 and 0.8,respectively.The distribution of scores and proportions for each assessment component can be adjusted based on the teaching schedule.</p>
Reading list	<p>Recommended Textbooks and Reference Books</p> <p>[1] Zhu Yongqiang,editor.New Energy and Distributed Power Generation Technology.Beijing: Peking University Press,2010.</p> <p>[2] Hui Jing,editor.New Energy Power Generation and Control Technologies.Beijing: China Machine Press,2012.</p> <p>[3] Wu Zhijian,editor.Utilization of New Energy and Renewable Energy.Beijing: China Machine Press,2006.</p>
Data of last mendment	<p>December 20,2025</p>