Wuxi University

09.2 Module Descriptions

Department of Electrical Engineering and Automation

School of Automation

2025

Content

Advanced Mathematics I(1)

Module designation	Advanced Mathematics I (1)
Semester(s) in which the module is taught	1th semester
Person responsible for the module	Yang Chunlong
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Science and Engineering Disciplines Type of teaching: Lecturing. Contact hour: 96 hours Including: Lecture Hours : 96 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 180 hours Contact hours = 96 hours Self-study hours = 84 hours
Credit points	6.0
Required and recommended prerequisites for joining the module	Elementary Mathematics
Module objectives/intended learning outcomes	To master the basic concepts, theories and methods of limits and continuity of functions, calculus of one-variable functions, ordinary differential equations, etc., and to lay the necessary mathematical foundation for the study of subsequent courses; to improve the ability of abstract thinking, logical reasoning and the ability of applying the knowledge of calculus to solve complex geometrical and physical problems; and to cultivate the scientific spirit of seeking truth from facts, thinking independently, and being brave to make innovations.

Content	**Chapter 1: Functions and Limits** **1. Teaching Content** (1) Mappings and Functions; (2) Limits of Sequences; (3) Limits of Functions; (4) Infinitesimals and Infinity; (5) Limit Operation Rules; (6) Limit Existence Criteria & Two Fundamental Limits; (7) Comparison of Infinitesimals; (8) Continuity and Discontinuities of Functions; (9) Operations on Continuous Functions & Continuity of Elementary Functions; (10) Properties of Continuous Functions on Closed Intervals. **Chapter 2 Derivatives and Differentials** **1. Teaching Content** (1) Concept of derivatives; (2) Derivative rules for functions; (3) Higher-order derivatives; (4) Derivatives of implicit functions and functions defined by parametric equations; related rates; (5) Differentials of functions. **Chapter 3 Mean Value Theorems and Applications of Derivatives** **1. Teaching Content** (1) Mean value theorems of differential calculus; (2) L'Hôpital's Rule; (3) Taylor's formula; (4) Monotonicity of functions and concavity of curves; (5) Extrema of functions; maximum and minimum values; (6) Graphical representation of functions; (7) Curvature. **Chapter 4 Indefinite Integrals** **1. Teaching Content** (1) Concept and properties of indefinite integrals; (2) Integration by substitution;

	Chapter 5 Definite Integrals **1. Teaching Content** (1) Concept and properties of definite integrals; (2) Fundamental theorem of calculus; (3) Substitution method and integration by parts for definite integrals; (4) Improper integrals. **Chapter 6 Applications of Definite Integrals** **1. Teaching Content** (1) Method of infinitesimal elements in definite integrals; (2) Geometric applications of definite integrals; (3) Physical applications of definite integrals. **Chapter 7 Differential Equations** **1. Teaching Content** (1) Basic concepts of differential equations; (2) Separable differential equations; (3) Homogeneous equations; (4) First-order linear differential equations; (5) Higher-order differential equations reducible to lower order; (6) Higher-order linear differential equations; (7) Homogeneous linear differential equations with constant coefficients; (8) Nonhomogeneous linear differential equations with constant coefficients.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%; Final assessment (close book exam) accounts for 60%.
Reading list	[1] Advanced Mathematics (Micro Course Edition) (2nd Edition), edited by Zhang Tao and Yin Junfeng, published by People's Posts and Telecommunications Press in 2022. [2] Advanced Mathematics (Economics and Management) (3rd edition), edited by the School of Mathematical Sciences, Tongji University, published by Tongji University Press in 2017.

	[3] Advanced Mathematics, edited by Luo Qinglai, Yu Dagang, and Song Baisheng, published by Southeast University Press in 2003.
Data of last amendment	August 2024

Advanced Mathematics I(2)

Module designation	Advanced Mathematics I (2)
Semester(s) in which the module is taught	Second Semester
Person responsible for the module	Yuan Junli
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students:All majors in science, engineering, and economics and management fields Type of teaching: Lecturing. Contact hour: 96 hours Including: Lecture Hours : 96 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 180 hours Contact hours = 96 hours Self-study hours = 84 hours
Credit points	6.0
Required and recommended prerequisites for joining the module	Advanced Mathematics I(1)
Module objectives/intended learning outcomes	To master the basic concepts, theories and methods of limits and continuity of functions, calculus of one-variable functions, ordinary differential equations, etc., and to lay the necessary mathematical foundation for the study of subsequent courses; to improve the ability of abstract thinking, logical reasoning and the ability of applying the knowledge of calculus to solve complex geometrical and physical problems; and to cultivate the scientific spirit of seeking truth from facts, thinking independently, and being brave to make innovations.

Content	**Chapter 8 Vector Algebra and Analytic Geometry of Space** **1. Teaching Content** (1) Vectors and their linear operations; (2) Dot product; Cross product; (3) Planes and their equations; (4) Spatial lines and their equations; (5) Surfaces and their equations; (6) Space curves and their equations. **Chapter 9 Differential Calculus of Multivariable Functions and Its Applications** **1. Teaching Content** (1) Basic concepts of multivariable functions; (2) Partial derivatives; (3) Total differential; (4) Differentiation rules for multivariate composite functions; (5) Differentiation formulas for implicit functions; (6) Geometric applications of multivariable differential calculus; (7) Directional derivatives and gradients; (8) Extrema of multivariable functions and their computation. **Chapter 10 Multiple Integrals** **1. Teaching Content** (1) Concept and properties of double integrals; (2) Computation methods for double integrals; (3) Triple integrals; (4) Applications of multiple integrals. **Chapter 11 Line Integrals and Surface Integrals** **1. Teaching Content** (1) Line integrals with respect to arc length; (2) Line integrals with respect to coordinates; (3) Green's theorem and its applications; (4) Surface integrals with respect to area; (5) Surface integrals with respect to coordinates; (6) Gauss's theorem;

	(7) Stokes' theorem. **Chapter 12 Infinite Series** **1. Teaching Content** (1) Concepts and properties of constant-term series; (2) Convergence tests for constant-term series; (3) Power series; (4) Expanding functions into power series; (5) Fourier series.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. The course assessment comprises: classroom participation and discussions with post-class feedback performance (40%) + final exam assessment (60%).
Reading list	**1. Required books** [1] Advanced Mathematics (Micro-course Edition, Vol. 2) (2nd ed.), edited by Zhang Tao and Yin Junfeng, People's Posts and Telecommunications Publishing House, 2022. [2] Advanced Mathematics (Vol. 2), edited by Wang Shunfeng, Xia Dafeng et al., Higher Education Press, 2013.
Data of last amendment	August 2024

Linear Algebra

Module designation	Linear Algebra
Semester(s) in which the module is taught	Second Semester
Person responsible for the module	Zhu Fengqin
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students:All majors in science, engineering, and economics and management fields Type of teaching: Lecture method, discussion method, and exercise method. Contact hour: 48 hours Including: Lecture Hours : 48 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Advanced Mathematics
Module objectives/intended learning outcomes	The main tasks are to study determinants, matrix theory, linear dependence of vectors, systems of linear equations, quadratic forms, and related knowledge. Students will master the basic concepts, understand the basic theories and methods of linear algebra, initially grasp its fundamental ideas and approaches, and develop the ability to analyze and solve practical problems using linear algebra.

Content	**Chapter 1 Determinants** **1. Teaching Content** (1) Second-order and third-order determinants; (2) Permutations and inversions; (3) Definition of n-order determinants; (4) Properties of determinants; (5) Expansion of determinants by rows or columns. **Chapter 2 Matrices and Their Operations** **1. Teaching Content** (1) The concept of systems of linear equations and the corresponding matrix representations; (2) Matrix operations; block matrices; (3) Inverse matrices; (4) Cramer's rule; (5) Matrix partitioning. **Chapter 3: Elementary Transformations of Matrices and Systems of Linear Equations** **1. Teaching Content** (1) Elementary transformations of matrices; (2) Rank of matrices; (3) Solutions of systems of linear equations. **Chapter 4 Linear Dependence of Vector Groups** **1. Teaching Content** (1) Vector groups and their linear combinations; (2) Linear dependence and independence of vector groups; (3) Rank of vector groups; (4) Vector spaces; (5) Structure of solutions to systems of linear equations. **Chapter 5 Similar Matrices and Quadratic Forms** **1. Teaching Content** (1) Inner product, length, and orthogonality of vectors; (2) Eigenvalues and eigenvectors of square matrices; (3) Similar matrices; (4) Diagonalization of real symmetric matrices;

	(5) Quadratic forms and their standard forms; (6) Positive definite quadratic forms.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%(consisting of homework 20% + classroom discipline and participation 10% + midterm exam 10%) Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Linear Algebra (2nd Edition), edited by Pu Yanmin and Yin Junfeng, People's Posts and Telecommunications Press, 2022. [2] Linear Algebra, edited by Kong Xinlei and Sun Mingzheng, Tsinghua University Press, 2021. [3] Linear Algebra and Its Applications (2nd Edition), written by Mao Lixin, Xian Meixin, and Yang Zhiyan, Higher Education Press, 2022. [4] Linear Algebra (Original 10th Edition), by Steven J. Leon and Lisette G. de Pillis, translated by Zhang Wenbo and Zhang Lijing, 2023.
Data of last amendment	August 2024

Probability Theory and Statistics

Module designation	Probability Theory and Statistics
Semester(s) in which the module is taught	Third Semester
Person responsible for the module	Zhang Guangle
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Science, Engineering, Economics & Management Type of teaching: Lecturing, discussion-based teaching, case-based teaching, etc. Contact hour: 48 hours (Including Lecture Hours : 48 hours) Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Advanced Mathematics, Linear Algebra
Module objectives/intended learning outcomes	Through this course, students will understand and master the basic concepts of probability theory and mathematical statistics, understand their basic theories and research methods, guide students to transition from traditional deterministic thinking modes to stochastic thinking modes, train their mathematical thinking, enhance their logical thinking and reasoning abilities, and cultivate their basic abilities and qualities in applying probability and statistical knowledge and methods to analyze and solve practical problems. This will lay a necessary and solid mathematical foundation for students' subsequent professional courses and even for handling practical problems in future work and life.

Content	**Chapter 1: Random Events and Probability** 1. **Teaching Content** (1) Random events; (2) Probability; (3) Conditional probability; (4) Independence of events. **Chapter 2: Random Variables and Their Distributions** **Teaching Content** 1. **Teaching Content** (1) Random variables and distribution functions; (2) Discrete random variables; (3) Continuous random variables; (4) Distributions of functions of random variables. **Chapter 3: Multidimensional Random Variables and Their Distributions** 1. **Teaching Content** (1) Two-dimensional random variables and their distributions; (2) Marginal distributions and independence of random variables; (3) Distributions of functions of two-dimensional random variables. **Chapter 4: Numerical Characteristics and Limit Theorems** 1. **Teaching Content** (1) Mathematical expectation; (2) Variance; (3) Covariance and correlation coefficient; (4) Law of Large Numbers and Central Limit Theorem. **Chapter 5: Statistics and Their Distributions** 1. **Teaching Content** (1) Population, sample, and statistics; (2) Sampling distributions. **Chapter 6: Parameter Estimation** 1. **Teaching Content** (1) Point estimation; (2) Interval estimation. **Chapter 7: Hypothesis Testing**

	1. **Teaching Content** (1) Basic concepts of hypothesis testing; (2) Hypothesis testing of parameters of normal populations.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Forms of the course assessment include discussion in class and feedback after class (40%)+result-based assessment(60%).
Reading list	**1. Required books** [1] Probability Theory and Mathematical Statistics, edited by Cao Guangxi, Meng Xiangrui, and Wang Bei, published by Higher Education Press in 2021; [2] Probability Theory and Mathematical Statistics (5th Edition), edited by Sheng Zhou and Xie Qianshi, published by Higher Education Press in 2019.
Data of last amendment	August 2024

Complex Function and Integral Transformation

Module designation	Complex Functions and Integral Transformation
Semester(s) in which the module is taught	Third Semester
Person responsible for the module	Zhu Fengqin
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All Engineering Majors Type of teaching: Combining Lecturing with Practice Contact hour: 32 hours Including: Lecture Hours : 32 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload =60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Advanced Mathematics, Linear Algebra
Module objectives/intended learning outcomes	This course consists of two parts: Complex Functions and Integral Transforms. Through the study of Complex Functions, students will understand fundamental concepts and related theories such as complex functions, analytic functions, complex integrals, Taylor series, Laurent series, and residues, thereby laying a solid theoretical foundation for the subsequent study of Integral Transform theory. Integral Transforms introduces the two most basic types of integral transforms: Fourier Transform and Laplace Transform, enabling students to comprehend their definitions and practical significance. Students will also grasp the

	relationships between these two transforms, understand their properties and calculations, and gain a preliminary understanding of their basic applications. Through the study of this course, students will master the basic theories and methods of the course and develop the ability to apply complex function and integral transform techniques to solve practical problems. Additionally, the course aims to cultivate students' abstract thinking and logical reasoning abilities, thereby laying a solid mathematical and physical foundation for subsequent courses and practical engineering applications.
Content	**Chapter 1 Complex Numbers and Complex Functions** **1. Teaching Content** (1) Complex Numbers; (2) Trigonometric Representation of Complex Numbers; (3) General Concepts of Plane Point Sets; (4) Complex Functions. **Chapter 2: Analytic Functions** **1. Teaching Content** (1) Concept of Analytic Functions (2) Elementary Functions **Chapter 3: Integration of Complex Functions** **1. Teaching Content** (1) Concept of Complex Integrals: Definition and introduction. (2) Cauchy's Integral Theorem: Statement, conditions, and implications. (3) Cauchy's Integral Formula: Derivation and applications. (4) Higher-Order Derivatives of Analytic Functions: Calculation methods and properties. **Chapter 4: Series Representation of Analytic Functions** **1. Teaching Content** (1) Complex-number term series; (2) Series of complex-variable function terms; (3) Taylor series; (4) Laurent series. **Chapter 5: Residues and Their Applications** **1. Teaching Content**

	(1) Isolated singularities; (2) Residues. **Chapter 6: Fourier Transform** **1. Teaching Content** (1) Concept of Fourier Transform; (2) Properties of Fourier Transform. Chapter Seven: Laplace Transform 1. Teaching Content (1) Concept of Laplace Transform; (2) Properties of Laplace Transform; (3) Inverse Laplace Transform.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Forms of the course assessment include discussion in class and feedback after class (40%)+result-based assessment(60%).
Reading list	**1. Required books** [1] Functions of Complex Variables, compiled by the Advanced Mathematics Teaching and Research Section of Xi'an Jiaotong University, Higher Education Press, June 2023 edition. [2]Integral Transforms, compiled by the Department of Mathematics of Southeast University, Higher Education Press, 2003 edition.
Data of last amendment	August 2024

College Physics II(1)

Module designation	College Physics II(1)
Semester(s) in which the module is taught	Semester 2
Person responsible for the module	Liu Xiaodan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Science and Engineering Majors Type of teaching: organic integration of online learning and offline classroom teaching. Online teaching is mainly based on students' autonomous learning, and students complete online learning tasks such as course preview, video learning, online exercises, online tests, etc. Off-line teaching includes classroom theory teaching and training consolidation. Classroom teaching mainly adopts case-driven method, with teachers mainly teaching relevant knowledge points, supplemented by necessary classroom discussions, operation demonstrations, etc. Contact hour: 48 hours Including: Lecture Hours : 48 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload =90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Advanced Mathematics
Module	Learning through College Physics II(1), it can enable students to have a more systematic understanding and correct understanding of the basic

objectives/intended learning outcomes	concepts, theories and methods of physical knowledge such as particle kinematics and particle dynamics, particle (system) motion theorem and mechanical energy conservation law, momentum conservation law, angular momentum conservation law and rigid body dynamics, vibration and fluctuation, special relativity and gas dynamics theory, laying a solid foundation for further study of subsequent professional courses.
Content	**Chapter 1 Motion of the particle** **1. Teaching content** (1) Mass and reference system; (2) Describe the physical quantities of particle motion; (3)The coordinate system describing the motion of the particle; (4) Newton's law of motion; (5) common forces in mechanics; (6) Galileo's principle of relativity. **Chapter 2 The Law of Conservation of Mechanical Energy** **1. Teaching content** (1) work and power; (2) kinetic energy and kinetic energy theorem; (3) potential energy; (4) the law of conservation of mechanical energy. **Chapter 3 The Law of Conservation of Momentum** **1. Teaching content** (1) momentum and momentum theorem; (2) the momentum theorem of the particle system and the theorem of the hanging center motion; (3) the law of conservation of momentum; (4) The collision. **Chapter 4 Law of Conservation of Angular Momentum** **1. Teaching content** (1) Torque; (2) The law of conservation of particle angular momentum. **Chapter 5 Rigid Body Mechanics** **1. Teaching content** (1) movement of rigid body;

	(2) Rigid body dynamics; (3) The law of conservation of angular momentum of a fixed-axis rotating rigid body. **Chapter 7 Vibration and Fluctuation** **1. Teaching content** (1) Simple harmonic vibration; (2) superposition of harmonic vibration; (3) Basic concepts of volatility; (4) Simple harmonic; (5) wave interference. **Chapter 9 Basic Properties of Gases** **1. Teaching content** (1) Gas dynamic theory and ideal gas model; (2) the pressure and temperature of the ideal gas; (3) The internal energy of the ideal gas.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. The course assessment methods include: usual scores (40%, including mid-term Test 10% + course assignment 20% + classroom performance 10%)+ result assessment (60%).
Reading list	**1. recommend teaching material** Physics (Fifth Edition), edited by Liu Kezhe and others, Higher Education Press, 2018. **2. Bibliography and Literature** [1] "Physics" (3rd Edition) (Part I), edited by Zhang Sanhui, Higher Education Press, 2017. [2] "Physics" (6th Edition) (upper and lower), edited by Ma Wenwei, Higher Education Press, 2014.
Data of last amendment	August 2024

College Physics II(2)

Module designation	College Physics II(2)
Semester(s) in which the module is taught	The 3rd Semester
Person responsible for the module	Yang yinbiao
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Science and Engineering Majors Type of teaching: The teaching method involves an organic integration of online learning and offline classroom lectures. Online teaching mainly relies on students' independent learning. Students complete learning tasks such as course preview, video learning, online exercises, and online tests online. Offline teaching includes classroom theoretical lectures and training for reinforcement. Classroom teaching mainly adopts the case-driven method, with teachers explaining relevant knowledge points, supplemented by necessary classroom discussions and operation demonstrations.Contact hour: 48 hours Including: Lecture Hours : 48 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload =90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Advanced Mathematics, College Physics II(1)
Module	By studying the "College Physics II (2)" course, students can gain a systematic understanding and correct comprehension of the basic

objectives/intended learning outcomes	concepts, theories, and methods of physical knowledge such as electrostatic fields, steady magnetic fields, electromagnetic induction, wave optics, and waves and particles, which will lay a solid foundation for further study of subsequent courses. Throughout the teaching process of the college physics course, while imparting knowledge, great emphasis is laid upon cultivating students' problem-analysis and problem-solving abilities, as well as their spirit of exploration and innovation, striving to achieve the coordinated development of students' knowledge, abilities, and qualities.
Content	**Chapter 10 Charge and Electrostatic Field** **1. Teaching Content** (1)Charge and Coulomb's Law; (2) Electric Field and Electric Field Intensity; (3) Gauss's Theorem; (4) Electric Potential and Its Relationship with Electric Field Intensity; (5) Metal Conductors in Electrostatic Fields; (6) Capacitance and Capacitors; (7)Dielectrics in Electrostatic Fields; (8) Energy of Electrostatic Fields. **Chapter 11 Current and Steady Magnetic Field** **1. Teaching Content** (1) Conditions for Steady Current and Conductivity Laws; (2) Magnetic Field and Magnetic Induction Intensity; (3) Biot - Savart Law; (4) Gauss's Theorem of Magnetic Field and Ampere's Circuital Law; (5) The Action of Magnetic Field on Current; (6) The Action of a Magnetic Field on Charged Particles; (7) Magnetization of Magnetic Media. **Chapter 12 Electromagnetic Induction** **1.Teaching Content** (1) Electromagnetic induction and its basic laws; (2) Mutual inductance and self-inductance; (3) Energy of the magnetic field. **Chapter 14 Optics**

	1. Teaching Content (1) Basic Laws and Principles in Geometric Optics; (2) Light Waves and Their Coherence Conditions; (3) Young's Double - Slit Interference; (4) Thin - Film Interference; (5) Huygens - Fresnel Principle and Classification of Diffraction Phenomena; (6) Fraunhofer Diffraction of Single Slit and Circular Aperture; (7) Diffraction Grating; (8) Applications of Diffraction Laws. **Chapter 15 Waves and Particles** **1. Teaching Content** (1) Black - Body Radiation; (2) Photoelectric Effect; (3) Compton Effect.
Examination forms	Close book
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. The assessment methods for this course include discussion in class and feedbacks after class (40%) + result-based assessment (60%).
Reading list	**1. Recommended Textbooks** Physics (5th Edition), edited by Liu Kezhe, et al., Higher Education Press, 2019. **2. Reference Books and Literature** [1] Physics (3rd Edition) (Volume I), edited by Zhang Sanhui, Higher Education Press, 2017. [2] Physics (6th Edition) (Volumes I and II), edited by Ma Wenwei, Higher Education Press, 2014. [3] Principles of Physics (Third Edition), by Serway & Jewett, Tsinghua University Press, 2004.
Data of last amendment	August 2024

College Physics Experiment II

Module designation	College Physics Experiment II
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Lecturer Yang Yinbiao
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	This course adopts an integrated approach that combines online learning with offline classroom instruction and laboratory practice.
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	College Physics
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Master the theories of experimental error and uncertainty, and understand their significance in physical measurements. 2. Grasp the basic methods of experimental data processing, such as the tabulation method, difference method, and graphical method. 3. Master the measurement techniques of typical physical quantities, including length, time, temperature, velocity, current, voltage, and resistance. 4. Become familiar with the structure and operational principles of common experimental instruments, and master their correct usage. 5. Understand the fundamental principles and important applications of various physics experiments. ● **Skill:** 1. Be able to independently complete assigned experimental projects after preparation, with standardized operation, accurate data recording and processing, reasonable results, and reliable conclusions. 2. Possess a preliminary ability to analyze sources of experimental

	error and assess their impact on results. 3. Develop an initial ability to relate theory to practice, using theoretical knowledge to analyze and interpret experimental phenomena. **4.** Be able to objectively evaluate experimental results and write qualified laboratory reports that meet academic standards. ● **Competence:** 1. Cultivate a scientific attitude of seeking truth from facts and a serious, responsible work ethic that emphasizes the integration of theory with practice. 2. Foster an enterprising and inquisitive spirit, constantly striving for improvement and excellence in experimental exploration. 3. Develop a collaborative mindset, encouraging mutual cooperation and collective inquiry among classmates in experimental work.
Content	**Experiment teaching** (48 contact hours; 42 self-study hours) **Chapter 1 Introduction** (3 contact hours; 2 self-study hours) 1. Teaching Content (1) Status, Role, and Objectives of Physics Experiments Electric Field and Electric Field Intensity. (2) Course Structure, Teaching Requirements, and Measurement Fundamentals. (3) Uncertainty Theory and Data Processing Methods. **Chapter 2 Length Measurement** (3 contact hours; 2 self-study hours) 1. Teaching Content (1) Principle of vernier and micrometer screw devices. (2) Use of vernier caliper and micrometer. (3) Data processing. **Chapter 3 Measurement of Object Density** (3 contact hours; 2 self-study hours) 1.Teaching Content (1) Application of force sensors. (2) Measurement of regular object density using measurement rules. (3) Measurement of irregular object density using the hydrostatic balance method. **Chapter 4 Measurement of Moment of Inertia Using a Trifilar Pendulum**

	(3 contact hours; 2 self-study hours) 1. Teaching Content (1) Measure the moment of inertia of a ring and a cylinder about their symmetric axes using a trifilar pendulum. (2) Verify the parallel axis theorem. **Chapter 5 Moment of Inertia About the Symmetric Axis** (3 contact hours; 3 self-study hours) 1. Teaching Content (1) Measure the moment of inertia of an object about its symmetric axis. (2) Verify the parallel axis theorem **Chapter 6 Measurement of Liquid Viscosity Using the Falling Ball Method**(3 contact hours; 2 self-study hours) (1) Phenomenon of internal friction and viscosity in liquids. (2) Basic principle of measuring viscosity using the falling ball method. **Chapter 7 Measurement of Resistance Using a Wheatstone Bridge** (3 contact hours; 2 self-study hours) (1) Basic principle and operation method of measuring resistance with a Wheatstone bridge. (2) Structure of the box-type bridge. (3) Wiring method of the panel-type bridge. **Chapter 8 Use of the Oscilloscope** (3 contact hours; 3 self-study hours) (1) Structure and basic working principle of the oscilloscope. (2) Methods for measuring the voltage and period of signals using the oscilloscope. (3) Measurement of sine wave frequency using Lissajous figures. **Chapter 9 Measurement of Lens Curvature Radius Using Newton's Rings**(3 contact hours; 3 self-study hours) (1) Observe equal-thickness interference phenomena and understand the characteristics of equal-thickness interference to deepen the understanding of the wave nature of light. (2) Learn to use Newton's rings to measure the curvature radius of a lens. **Chapter 10 Measurement of Solution Concentration Using a Polarimeter** (3 contact hours; 3 self-study hours) (1) Observe the optical rotation phenomenon of linearly polarized

	light passing through optically active substances and understand the structure and working principle of the polarimeter. (2) Use the polarimeter to measure the optical rotation and concentration of optically active solutions. **Chapter 11 Measurement of Young's Modulus of a Metal Wire Using the Static Tensile Method** (3 contact hours; 3 self-study hours) (1) Principle and method of measuring small elongation using the optical lever method. (2) Data processing using the method of successive differences. (3) Estimation of the uncertainty of a single measurement. **Chapter 12 Measurement of the Surface Tension Coefficient of a Liquid**(3 contact hours; 3 self-study hours) (1) Concept of surface tension and surface tension coefficient. (2) Force analysis during the stretching process of a liquid film and derivation of the measurement formula for the surface tension coefficient. (3) Use of a force sensor. **Chapter 13 Measurement of Temperature Using a Thermocouple and Determination of the Temperature Coefficient of Platinum**(3 contact hours; 3 self-study hours) (1) Principle of measuring the temperature coefficient of metal resistance. (2) Principle and method of temperature measurement using a thermocouple. (3) Data processing — graphical method. **Chapter 14 Hall Effect and Its Applications** (3 contact hours; 3 self-study hours) (1) Mechanism of the Hall effect. (2) Characteristics of Hall elements and applications of the Hall effect. (3) Data processing using the graphical method. **Chapter 15 Michelson Interferometer** (3 contact hours; 3 self-study hours) (1) Structure, working principle, and adjustment method of the Michelson interferometer. (2) Principle and method of measuring the wavelength of He–Ne laser light using the Michelson interferometer. **Chapter 16 Measurement of the Speed of Light** (3 contact hours; 3 self-study hours)

	(1) Structure, working principle, and adjustment method of the light speed measurement apparatus. (2) Relationship between prism displacement and phase variation. (3) Modulation of light. **(4)** Methods of phase measurement.
Examination forms	Assessment (Laboratory Report)
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. The assessment methods for this course include 30% regular performance (attendance 10% + pre-lab reports 10% + lab performance 10%) and 70% result-based assessment.
Reading list	**1.Recommended book:** Chen, Y. College physics experiments. Shanghai Jiao Tong University Press, 2024. **2.References:** [1] Liu, W. (2022). College physics experiment tutorial. Higher Education Press. [2] Wu, P. (2024). Physics experiment tutorial for science majors. Tsinghua University Press. [3] Du, H. (2020). College physics experiments. Science Press. [4] You, B., et al. (2021). College physics experiments – Basic and advanced edition. Higher Education Press. [5] Pu, T., et al. (2018). College physics experiments(2nd ed.). Tsinghua University Press.
Data of last amendment	August 2024

Major Introduction

Module designation	Major Introduction
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Ji Nan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 16 hours Including: Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1
Required and recommended prerequisites for joining the module	/
Module	Learning outcomes:

objectives/intended learning outcomes	● **Knowledge:** 1. Understand the broad technical theories required in the field, including automation instruments, industrial process control, computer control, and simulation systems. 2. Understand the theoretical frontiers and development trends of the discipline. 3. Master electrical safety standards and their applications in industrial environments. 4. Understand the working principles and maintenance requirements of common electrical/electronic instruments and tools. ● **Skill:** 1. Ability to use automation instruments and perform basic operations in industrial process control. 2. Ability to analyze and solve technical problems in electrical engineering and automation. 3. Ability to maintain and calibrate electrical/electronic instruments according to technical specifications. ● **Competence:** 1. Use advanced tools for program design and structural modeling of automated systems. 2. Evaluate the integration of automation technologies with emerging trends. 3. Design compliant electrical systems by applying safety standards and risk assessment methodologies.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study hours) **Chapter 1 Introduction** (4 contact hours; 2 self-study hours)

	● History of the Development of Electrical science ● Theoretical Basis of Electrical Engineering ● Commonly used software in electrical engineering **Chapter 2 Electrical and Electrical Appliances** (4 contact hours; 4 self-study hours) ● Motor classification and Structure ● Motor Application and Control ● Classification of electrical appliances ● High and low voltage electrical appliances **Chapter 3 Power System and Its Automation** (2 contact hours; 2 self-study hours) ● Development and Introduction of Power System ● Composition of the power system **Chapter 4 Power Electronics** (2 contact hours; 2 self-study hours) ● The development history of power Electronics ● Characteristics, research contents and applications of power Electronics **Chapter 5 High Voltage and Insulation Technology** (2 contact hours; 2 self-study hours) ● High voltage technology ● High voltage and insulation technology **Chapter 6 New Electrician Technologies** (2 contact hours; 2 self-study hours) ● The current situation of new electrical technologies ● Development Trends of New Electrical Engineering technologies **Part B. Experiment teaching** (0 hours)
Examination forms	Course Essay

Study and examination requirements	Classroom learning discussions and post-class feedback performance (40%, including 20% of course hours for discussion and 20% of post-class assignments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Fan Yu. Introduction to Electrical Engineering (Third Edition) [M]. Beijing: Higher Education Press, 2021. **2.Reference books** [1] Wei Gang, Cao Zhengqin, Wang Jia. Introduction to Electrical Engineering [M]. Chongqing: Chongqing University Press, 2022. [2] Jia Wenchao. Introduction to Electrical Engineering [M]. Xi 'an: Xidian University Press, 2014.
Data of last amendment	July 11, 2024

Principle and Application of PLC

Module designation	Principle and Application of PLC
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Ge Xuejian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the hardware components, functional principles, and installation/maintenance requirements of PLC systems. 2. Master the basic instructions of PLC programming and the structure of sequential control programming. 3. Understand the concepts and implementation methods of structured programming. ● **Skill:** 1. Ability to apply sequential control logic to design PLC programs for common industrial scenarios. 2. bility to implement structured programming techniques to optimize PLC code readability and scalability. 3. Ability to configure PLC control systems and perform control operations. ● **Competence:** 1. Use PLC-specific instructions to analyze and solve engineering problems. 2. Use advanced simulation tools for structural modeling and validation of complex PLC control strategies. 3. Analyze system requirements and design integrated PLC solutions under technical constraints.
Content	**Part A. Theoretical teaching** (24 contact hours; 14 self-study hours) **Chapter 1 Understanding S7-1200 PLC** **Chapter 2 Motor Control** **Chapter 3 Control of Flowing Light** **Chapter 4 Traffic Light Control** **Chapter 5 Round-trip Operation of the Material Transport Trolley** **Chapter 6 Automated production line**

	Chapter 7 Factory IO **Part B. Experiment teaching** (8 contact hours; 14 self-study hours) **Chapter 1 Assembly line** **Chapter 2 Four conveyor belts** **Chapter 3 Traffic light** **Chapter 4 The transport cars**
Examination forms	Work testing and design report
Study and examination requirements	Regular performance (40%, including 15% course participation + 15% after-class assignments + 10% experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Zhou Wenjun. Siemens S7-1200/1500 PLC Project-based Tutorial-Programming Based on SCL and LAD [M]. Beijing: Press of Electronics Industry, 2023. **2.Reference books** [1] Liao Changchu. Programming and Application of S7-1200 PLC, 4th Edition [M]. Beijing: Machinery Industry Press, 2021. [2] Wu Fanhong. Siemens S7-1200 PLC Application Technology Project Tutorial (2nd Edition) [M]. Beijing: Press of Electronics Industry, 2021. [3] Li Fangyuan. S7-1200PLC Application Technology [M]. Beijing: Publishing House of Electronics Industry, 2023.
Data of last amendment	July 11, 2024

Sensor and Detection Technology

Module designation	Sensor and Detection Technology
Semester(s) in which the module is taught	2rd semester
Person responsible for the module	Lecturer Yuan Quan
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, PLC Application Innovation Design
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic definitions, working principles, and characteristics of sensors across different application fields. 2. Summarize sensor selection principles and application methods for specific scenarios. 3. Distinguish the differences between sensor detection circuits and their design requirements. 4. List common data statistics and processing methods for sensor-based systems. ● **Skill:** 1. Ability to analyze application requirements, select appropriate sensors, and design detection circuits. 2. Ability to optimize sensor performance and detection circuit parameters using engineering tools. 3. Ability to troubleshoot experimental phenomena and validate data repeatability in lab settings. 4. Ability to use simulation tools for sensor system modeling and performance prediction. ● **Competence:** 1. Design and construct experimental systems based on sensor application requirements. 2. Use advanced data acquisition tools to ensure safe and reliable data collection. 3. Evaluate sensor system reliability through comprehensive data analysis. 4. Integrate multidisciplinary knowledge to solve complex engineering problems.
Content	**Part A. Theoretical teaching** (24 contact hours; 16 self-study hours) **Chapter 1 Introduction**

	Chapter 2 Resistive Sensors **Chapter 3 Variable Impedance Sensors** **Chapter 4 Electromotive Force Sensors** **Chapter 5 Photoelectric Sensors** **Part B. Experiment teaching** (8 contact hours; 12 self-study hours) **Chapter 1 Photoresistor experiment** **Chapter 2 Application of Strain Gauge DC Full Bridge - Electronic Scale Experiment** **Chapter 3 Hall sensor Experiment** **Chapter 4 Encoder experiment**
Examination forms	Close book
Study and examination requirements	Regular performance (40%, including regular performance 10%+ homework 10%+ experiments 15%+ mid-term examination 5%) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Sensors and Detection Technology. Ye Tingdong, Chen Gengxin, Jiang Xianqun, Zhu Feihu, Yu Changgeng. Tsinghua University Press, 2021. [2] Fundamentals of Sensors and Detection Technology. Wu Songlin. Beijing Institute of Technology Press, 2022.
Data of last amendment	July 11, 2024

New Energy Generation and Inverter Technology

Module designation	New Energy Generation and Inverter Technology
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Ji Nan
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 48 hours Including: Theoretical teaching: 40 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Power Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the development history, current status, and future trends of renewable energy generation and microgrid systems. 2. Master the working principles of photovoltaic generation, maximum power point tracking technology, and control strategies for PV batteries and controllers. 3. Master the core technologies of wind-solar hybrid power generation systems. 4. Understand the characteristics of common inverter technologies. ● **Skill:** 1. Ability to design PV and wind power generation systems. 2. Ability to analyze and optimize renewable energy systems using technical standards and specifications. 3. Ability to configure inverter parameters for grid-connected applications. ● **Competence:** 1. Use advanced simulation tools to model and validate renewable energy systems. 2. Integrate multi-energy complementary solutions to address complex engineering challenges. 3. Evaluate the economic and technical feasibility of renewable energy projects.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Photovoltaic Power Generation and Its Maximum Power Point Tracking Technology** **Chapter 3 Photovoltaic Batteries and Photovoltaic Controllers** **Chapter 4 Photoelectric Sensors** **Chapter 5 Control Technology of Wind and Solar Generating Units**

	Part B. Experiment teaching **Chapter 1 Understanding of New Energy Power Generation and Microgrids** **Chapter 2 Photovoltaic power generation experiment** **Chapter 3 Microgrid island protection and grid-connected and off-grid experiments**
Examination forms	Course Essay
Study and examination requirements	Classroom learning discussion and post-class feedback performance (40%, including 10% course hour discussion + 10% post-class homework + 20% experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Fu Rong. New Energy Power Generation and Control Technology [M]. Beijing: China Electric Power Press, 2015. **2.Reference books** [1] Yang Ming, Yu Yixiao, Li Menglin. Advanced Prediction Technology for Wind and Solar New Energy Power Generation [M]. Beijing: Machinery Industry Press, 2023. [2] Zhu Yongqiang, Zhao Yuehong. New Energy Power Generation Technology [M]. Beijing: Machinery Industry Press, 2020.
Data of last amendment	July 11, 2024

AC and DC Speed Regulation System

Module designation	AC and DC Speed Regulation System
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 56 hours Including: Theoretical teaching: 48 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 105 hours Contact hours = 56 hours Self-study hours = 49 hours
Credit points	3.5
Required and recommended prerequisites for joining the module	Motor and Drive System
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic composition of electric drive control systems, torque control laws, and load characteristics of production machinery. 2. Master the fundamental principles, working mechanisms, and speed regulation characteristics of DC speed control systems. 3. Learn the theoretical foundations of system design for dual closed-loop DC motor speed control systems. ● **Skill:** 1. Ability to calculate and analyze operational characteristics of DC speed control systems and solve related engineering problems. 2. Capability to design experimental circuits based on objectives, content, and equipment, select appropriate instruments, and define experimental procedures. 3. Proficiency in using measurement tools to collect experimental data and apply basic analytical methods to interpret results. ● **Competence:** 1. Design and optimize dual closed-loop DC motor speed control systems by integrating theoretical knowledge with practical constraints. 2. Synthesize experimental data, draw conclusions, and prepare technical reports that meet industry standards. 3. Critically evaluate system performance and propose improvements using advanced tools and methodologies.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 DC Speed Regulation System with Open-loop Speed Control** **Chapter 3 DC Speed Regulation System with Closed-loop Control of Rotational Speed** **Chapter 4 DC Speed Regulation System with Double Closed-Loop Control of Speed/Current** **Part B. Experiment teaching**

	Chapter 1 Mechanical characteristic test of the DC speed regulation system with open-loop speed control under the condition of Ug= constant **Chapter 2 Mechanical characteristic test of the DC speed regulation system with open-loop speed control under the condition of Ud= constant** **Chapter 3 Mechanical characteristic test of DC speed regulation system with closed-loop control of rotational speed** **Chapter 4 Mechanical characteristic test of DC speed regulation system with double closed-loop control of rotational speed/current**
Examination forms	Course Essay
Study and examination requirements	Regular performance (40%) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Ruan Yi, Yang Ying, Chen Boshi. Electric Drive Automatic Control System (5th Edition) [M]. Beijing: Machinery Industry Press, 2016. **2.Reference books** [1] Cao Yongjuan. Experiment on Motor and Drive Control and Its MATLAB Simulation [M]. Beijing: Tsinghua University Press, 2014.
Data of last amendment	July 11, 2024

Power System Modeling and Simulation

Module designation	Power System Modeling and Simulation
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Ge Xuejian
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 8 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	Fundamentals of Electrical Engineering
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the principles and methods of using MATLAB/Simulink simulation platforms for power system modeling. 2. Understand the theoretical foundations of power system simulation, including model construction, parameter configuration, and simulation workflow. ● **Skill:** 1. Ability to design power system model structures independently based on specific requirements and establish corresponding simulation models. 2. Proficiency in analyzing simulation results, verifying their correctness, and diagnosing potential errors. 3. Competence in applying MATLAB/Simulink tools to implement and debug complex power system simulations. ● **Competence:** 1. Synthesize engineering knowledge and simulation techniques to innovate solutions for power system design challenges. 2. Cultivate scientific engineering thinking by integrating theoretical analysis with practical simulation outcomes. 3. Develop a rigorous and innovative engineering mindset through systematic exploration of model optimization and result validation.
Content	**Part A. Theoretical teaching** **Chapter 1 Basic Knowledge of Matlab** **Chapter 2 Introduction to Simulink Simulation** **Chapter 3 Introduction to Power System Component Models and Model Libraries** **Chapter 4 Application Examples of Matlab in Power System Flow Calculation** **Chapter 5 Simulation Examples of Matlab in Power System Fault Analysis**

	Chapter 6 Application Examples of Matlab in the Stability Analysis of Power Systems **Chapter 7 Application Examples of Matlab in Relay Protection** **Part B. Experiment teaching** **Chapter 1 Power system power flow simulation** **Chapter 2 Simulation of Power System Faults** **Chapter 3 Simulation of Power System Stability** **Chapter 4 Simulation of Relay Protection in Power systems**
Examination forms	Course Essay
Study and examination requirements	Regular performance (40%, including 10% course performance + 10% course assignments + 20% course experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Yu Qun, Cao Na. MATLAB/Simulink Power System Modeling and Simulation (3rd Edition) [M]. Beijing: Machinery Industry Press, 2024. **2.Reference books** [1] Wang Jing, Weng Guoqing, Zhang Youbing. MATLAB/SIMULINK Simulation and Application of Power System [M]. Xi 'an: Xidian University Press, 2015.
Data of last amendment	July 11, 2024

Power Supply and Distribution Technology

Module designation	Power Supply and Distribution Technology
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Huang Xing
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Fundamentals of Electrical Engineering, Power System Analysis
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master key terms and concepts of power supply and distribution systems. 2. Understand the principles of load calculation, high/low-voltage cable cross-sectional area selection, and material specifications. 3. Learn the hazards of overcurrent, overvoltage, and lightning surges, and their theoretical foundations. 4. Acquire knowledge of lightning protection, grounding systems, and safety standards for electrical equipment. ● **Skill:** 1. Perform load design calculations, cable sizing, and material selection based on engineering requirements. 2. Design and install lightning rods, grounding devices, and overcurrent/overvoltage protection systems. 3. Read and draft electrical schematics for power supply and distribution systems, including component identification. 4. Operate simulation software for designing and analyzing new energy generation and smart microgrid systems. 5. Diagnose faults and conduct routine maintenance, testing, and repairs of power distribution systems. ● **Competence:** 1. Integrate theoretical knowledge with practical constraints to optimize power system safety and stability. 2. Synthesize simulation results to validate design objectives and propose improvements for renewable energy integration. 3. Apply systematic engineering thinking to troubleshoot complex issues in power distribution operations. 4. Innovate solutions for emerging challenges using advanced tools and standards.
Content	**Part A. Theoretical teaching**

	Chapter 1 Introduction **Chapter 2 Main Electrical Equipment of the Power Supply and Distribution System** **Chapter 3 Load Calculation** **Chapter 4 Primary Wiring of Power Supply and Distribution System** **Chapter 5 Short-circuit Current Calculation and Selection of High and Low Voltage Electrical Appliances** **Chapter 6 Relay Protection of Power Supply and Distribution System** **Chapter 7 Secondary Circuit and Distribution Automation** **Chapter 8 Selection and Laying of Wires and Cables** **Chapter 9 Electrical Safety Protection** **Chapter 10 Lightning Protection, Overvoltage Protection and Grounding** **Chapter 11 Improvement of Power Quality** **Part B. Experiment teaching** **Chapter 1 Simulation of the power supply and distribution system for photovoltaic microgrid systems** **Chapter 2 Design and Simulation of Power Supply and Distribution System for Photovoltaic and Wind Turbine Hybrid Microgrid System**
Examination forms	Course Essay
Study and examination requirements	Regular performance (40%, including 20% regular performance + 10% after-school homework + 10% experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Liu Jiecai. Power Supply and Distribution Technology (4th Edition) [M], Beijing: Machinery Industry Press, 2020.

	2.Reference books [1] Wu Jiaofeng, Chen Long. Power Supply and Distribution Technology [M], Beijing: China Electric Power Press, 2020.
Data of last amendment	July 11, 2024

Engineering Drawing

Module designation	Engineering Drawing
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Gao Feng
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Major Introduction
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic theories of projection methods and their role in technical drawing. 2. Ability to implement national drawing standards in practical tasks. 3. Ability to utilize AutoCAD software to create technical drawings. ● **Skill:** 1. Ability to apply projection theories to accurately draw engineering views. 2. Ability to implement national drawing standards in practical tasks. 3. Ability to utilize AutoCAD software to create technical drawings. ● **Competence:** 1. Use projection principles and spatial reasoning for structural modeling of complex 3D objects. 2. Use CAD tools to optimize dimensioning workflows and ensure compliance with industrial standards. 3. Use advanced AutoCAD functionalities to solve engineering design problems.
Content	**Part A. Theoretical teaching** **Chapter 1 Basic Knowledge of Drawing** **Chapter 2 Fundamentals of Orthographic Projection** **Chapter 3 Basic Body and Body Surface Intersection Lines** **Chapter 4 Combinations** **Chapter 5 Assembly Drawing** **Part B. Experiment teaching** **Chapter 1 Fundamentals of Engineering Drawing and Drawing Practice** **Chapter 2 The basics of orthographic projection and experiments on 3D Geometric modeling** **Chapter 3 Experiment on drawing and analyzing the intersection lines**

	of the basic body and body surface **Chapter 4 Experiment on Orthographic projection Rendering and spatial Analysis of Combined Bodies**
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%, including 15% classroom performance + 10% after-class homework + 15% experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Zhu Juxiang, Guo Yecai, Li Peng. Modern Engineering Drawing (First Edition) [M]. Beijing: Machinery Industry Press, 2023. [2] Zhang Zhaoliang, Yao Zhaohua. Modern Engineering Drawing Exercise Book (First Edition) [M]. Beijing: Machinery Industry Press, 2023. **2.Reference books** [1] tate Bureau of Quality and Technical Supervision. GB/T 4457.4-2002 Drawing Method of Mechanical Drawing [M]. Beijing: China Standards Press, 2014. [2] Ding Yi, Wang Jian. Fundamentals of Engineering Graphics (Third Edition) [M]. Beijing: Higher Education Press, 2018. [3] He Jianying, Ruan Chunhong, Chi Jianbin, et al. Descriptive Geometry and Mechanical Drawing [M]. Beijing: Higher Education Press, 2016.
Data of last amendment	July 11, 2024

Circuit Theory

Module designation	Circuit Theory
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Yan Jiyuan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 64hours Including: Theoretical teaching: 48 hours Experiment teaching: 16 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 64 hours Self-study hours = 56 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronics, Fundamentals of Digital Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic concepts, laws, and theorems of lumped parameter circuits. 2. Master the fundamental principles and analytical methods for circuit design. 3. Understand the mathematical modeling requirements for applications in renewable energy generation, smart microgrids, and intelligent manufacturing systems. ● **Skill:** 1. Ability to analyze circuit characteristics and provide technical support for engineering fields. 2. Ability to identify critical challenges in complex engineering problems. 3. Ability to utilize simulation tools for circuit modeling and preliminary design validation. ● **Competence:** 1. Use advanced simulation tools for structural modeling and program design of circuits in renewable energy systems. 2. Use interdisciplinary knowledge to optimize circuit solutions under technical constraints. 3. Use standardized specifications and industry best practices to ensure compliance and innovation in circuit design.
Content	**Part A. Theoretical teaching** **Chapter 1 Circuit Models and Circuit Laws** **Chapter 2 Equivalent Transformation of Resistance Circuits** **Chapter 3 General Analysis of Resistance Circuits** **Chapter 4 Circuit Theorem** **Chapter 5 Energy Storage Components** **Chapter 6 Time-domain Analysis of First-Order Circuits** **Chapter 7 Phasor Method**

	Chapter 8 Analysis of Sinusoidal Steady-State Circuits **Chapter 9 A circuit with coupled inductors** **Chapter 10 Three-phase circuit** **Part B. Experiment teaching** **Chapter 1 The use of electrical instruments** **Chapter 2 Kirchhoff's law experiment** **Chapter 3 Superposition theorem experiment** **Chapter 4 Thevenin theorem experiment** **Chapter 5 Determination of the maximum power transfer point** **Chapter 6 Three-phase circuit experiment** **Chapter 7 Randomized experimental test**
Examination forms	Closed-book written exam
Study and examination requirements	Regular grades (40%, including 15% of course participation + 10% of homework + 10% of lab + 5% of mid-term exam) + results assessment (60%).
Reading list	**1.Required books** [1] Qiu Guanyuan, Luo Xianjue. Circuit (6th edition) [M]. Beijing: Higher Education Press, 2022.
Data of last amendment	July 11, 2024

Fundamentals of Analog Electronics

Module designation	Fundamentals of Analog Electronics
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Yan Jiyuan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 64 hours Including: Theoretical teaching: 48 hours Experiment teaching: 16 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 64 hours Self-study hours = 56 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Circuit Theory
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the working mechanisms of semiconductor devices and their mathematical descriptions based on fundamental circuit principles. 2. Understand the theoretical foundations of nonlinear analysis methods and small-signal equivalent modeling techniques. 3. Understand the functional characteristics of amplification circuits, feedback circuits, and power supply circuits. ● **Skill:** 1. Ability to abstract, simplify, and model circuits using nonlinear analysis and small-signal equivalence methods. 2. Ability to solve circuit performance indicators through analytical or numerical approaches. 3. Ability to operate instruments to measure experimental data, observe phenomena, and troubleshoot issues. ● **Competence:** 1. Design circuit schemes based on specifications and evaluate their feasibility through systematic analysis. 2. Extract critical engineering problems from complex scenarios and propose targeted solutions. 3. Integrate theoretical models with practical constraints to achieve design goals. 4. Validate circuit performance through experimental verification and iterative refinement.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Basics of Commonly Used Semiconductor Devices** **Chapter 3 Transistor Amplification Circuit** **Chapter 4 Field-Effect Transistor Amplifier Circuit** **Chapter 5 Integrated Operational Amplifier Circuits**

	Chapter 6 Negative Feedback Amplifier Circuit **Chapter 7 Signal Operation and Processing Circuits** **Chapter 8 Signal Generation Circuit** **Chapter 9 Power Amplifier Circuit** **Chapter 10 DC Regulated Power Supply** **Part B. Experiment teaching** **Chapter 1 Measurement of the volt-ampere characteristics of diodes** **Chapter 2 Single-tube co-emitting amplification circuit** **Chapter 3 Differential amplifier circuit** **Chapter 4 Negative feedback amplifier circuit** **Chapter 5 Integrate the application of operational computing in simulation operations** **Chapter 6 Active power filter** **Chapter 7 Random experiment**
Examination forms	Closed-book written exam
Study and examination requirements	Process-oriented assessment (40%, including 15% course participation + 10% assignment evaluation + 5% mid-term exam + 10% experiment) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Zhang Yonghong, Guo Yecai. Analog Electronic Technology (3rd Edition)[M]. Beijing: Tsinghua University Press, 2024. [2] Guo Yecai. Experimental Simulation Tutorial of Analog Electronic Technology [M]. Shaanxi: Xidian University Press, 2020.
Data of last amendment	July 11, 2024

Fundamentals of Digital Electronics

Module designation	Fundamentals of Digital Electronics
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Ge Xuejian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Advanced Mathematics I, College Physics II, Circuit Theory
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the fundamental theories of digital circuits, including Boolean algebra, logic gate operations, and number systems. 2. Master the working principles of common digital circuits. 3. Master the basic analysis and design methods for digital circuits. 4. Understand technical standards related to integrated circuits. ● **Skill:** 1. Ability to analyze and design combinational logic circuits and sequential logic circuits. 2. Ability to select research pathways and develop circuit solutions based on design requirements. 3. Ability to apply optimization methods to improve circuit performance. ● **Competence:** 1. Evaluate system performance from an engineering perspective. 2. Apply technical standards and industry best practices to optimize circuit design. 3. Integrate theoretical knowledge with practical constraints to solve complex engineering problems.
Content	**Part A. Theoretical teaching** **Chapter 1 Fundamentals of Logical Algebra** **Chapter 2 Gate Circuits** **Chapter 3 Combinational Logic Circuits** **Chapter 4 Triggers** **Chapter 5 Sequential Logic Circuits** **Chapter 6 555 Timer and Pulse Generation Shaping Circuit** **Chapter 7 Digital-to-Analog and Analog-to-Digital Conversion Circuits** **Part B. Experiment teaching** (0 hours)
Examination forms	Closed-book written exam

Study and examination requirements	Regular performance (40%, including 20% in-class quizzes and 20% homework) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Yu Mengchang. A Concise Tutorial on the Fundamentals of Digital Electronic Technology (4th Edition)[M]. Beijing: Higher Education Press, 2018. [2] Yan Shi. Fundamentals of Digital Electronic Technology (6th Edition) [M]. Beijing: Higher Education Press, 2016.
Data of last amendment	July 11, 2024

Digital Electronics Experiments

Module designation	Digital Electronics Experiments
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Ge Xuejian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	Fundamentals of Digital Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the principles of combinational and sequential logic circuits and their application in experimental design. 2. Master the technical specifications and documentation standards for experimental reports. ● **Skill:** 1. Ability to design comprehensive and functional experiments based on technical requirements. 2. Ability to construct digital electronic systems, troubleshoot circuit faults, and collect experimental data. 3. Ability to process experimental data and document complete experimental procedures and results. ● **Competence:** 1. Analyze and optimize experimental outcomes through theoretical calculations and systematic problem-solving. 2. Synthesize engineering knowledge to address complex practical challenges. 3. Innovate solutions by balancing design constraints and validating results through iterative experimentation.
Content	**Part A. Theoretical teaching** (0 hour) **Part B. Experiment teaching** **Chapter 1 Basic gate circuit** **Chapter 2 Three-state output gate** **Chapter 3 Decoder and Its applications** **Chapter 4 Data Selector and Its Applications** **Chapter 5 Combinational Logic Circuit design** **Chapter 6 Integrated Circuit flip-flops and Their applications** **Chapter 7 Shifting register**

	Chapter 8 Counter
Examination forms	Course Essay
Study and examination requirements	Design phased achievements (60%, including 20% experimental reports + 40% experimental operations) + result-oriented assessment (40%).
Reading list	**1.Required books** [1] Yu Mengchang. A Concise Tutorial on the Fundamentals of Digital Electronic Technology (4th Edition)[M]. Beijing: Higher Education Press, 2018.
Data of last amendment	July 11, 2024

Signals and Systems

Module designation	Signals and Systems
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Yuan Quan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 64 hours Including: Theoretical teaching: 56 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 64 hours Self-study hours = 56 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Advanced Mathematics I
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the mathematical modeling of continuous-time signals and systems. 2. Understand the expressions and characteristics of signals and systems in different domains. 3. Understand the core principles of discrete-time signal and system abstraction. 4. Learn the interdisciplinary connections between circuit theory and signal analysis. ● **Skill:** 1. Ability to analyze and compare signal/system properties using mathematical tools. 2. Ability to design research plans for complex engineering problems through literature review and systematic analysis. 3. Ability to conduct experimental training and troubleshoot technical issues. 4. Ability to document experimental processes and results with scientific rigor. ● **Competence:** 1. Evaluate complex engineering problems by integrating multi-domain signal analysis. 2. Synthesize mathematical models and circuit expertise to optimize system performance. 3. Propose innovative solutions through interdisciplinary knowledge fusion. 4. Validate theoretical hypotheses via experimental data and iterative refinement.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Time-domain Analysis of Continuous-time Systems**

	Chapter 3 Fourier Transform **Chapter 4 Laplace Transform and S-Domain Analysis of Continuous-time Systems** **Chapter 5 Fourier Transform Applied to Communication Systems** **Chapter 6 Time-domain Analysis of Discrete-time Systems** **Chapter 7 Z-transform, Z-domain analysis of discrete-time systems** **Part B. Experiment teaching** **Chapter 1 Step response and impulse response** **Chapter 2 Simulation of continuous-time systems** **Chapter 3 Sampling Theorem and Signal Recovery** **Chapter 4 Signal decomposition and synthesis**
Examination forms	Closed-book written exam
Study and examination requirements	Classroom learning discussions and post-class feedback performance (40%) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Zheng Junli, et al. Signals and Systems [M]. Higher Education Press, 2018. **2.Reference books** [1] Wang Baoxiang, et al. Signals and Systems (Second Edition)[M]. Harbin Institute of Technology Press, 2001. [2] Guan Zhizhong, et al. Signals and Linear Systems [M]. Higher Education Press, 2004. [3] Wu Dazheng, et al. Signals and Linear Systems [M]. Higher Education Press, 2005.
Data of last amendment	July 11, 2024

Microcomputer Principle and Micro-controller Technology

Module designation	Microcomputer Principle and Micro-controller Technology
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 48 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, C Language Programming
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic components and working principles of microcomputer hardware systems. 2. Master the architecture, operational principles, and working modes of microprocessors. 3. Understand instruction sets and basic programming methods for microprocessor-based systems. 4. Learn the principles and application design of human-machine interfaces, interrupt control systems, timers/counters, serial communication interfaces, and expansion interfaces. ● **Skill:** 1. Ability to design and configure hardware interfaces. 2. Ability to develop software-hardware integrated solutions. 3. Ability to implement timing/counting logic and communication protocols. 4. Ability to apply instruction sets to optimize system performance. ● **Competence:** 1. Integrate software and hardware knowledge to solve practical robotics control problems. 2. Design system-level solutions by combining interface modules. 3. Evaluate trade-offs between hardware constraints and software efficiency. 4. Innovate in cross-domain applications.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction to Microprocessor Technology** **Chapter 2 8086 Microprocessor and Its Architecture** **Chapter 3 Basic Structure of MCS-51 Series Single-Chip Microcomputers** **Chapter 4 Programming of Single-Chip Microcomputer in C51 Language**

	Chapter 5 Human-Machine Interface Design of Microprocessor Control System **Chapter 6 Design of Microprocessor Interrupts and Timing/Counter Applications** **Chapter 7 Communication Design of Microprocessor Control System** **Chapter 8 Interface Expansion of Microprocessor Control Systems** **Part B. Experiment teaching** (0 hour)
Examination forms	Closed-book written exam
Study and examination requirements	Regular assignments (30%) + major assignments (10%) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Li Jinghua et al. Principles of Microcomputers and Single-Chip Microcomputer Technology (2nd Edition) [M]. Beijing: Publishing House of Electronics Industry, 2023.
Data of last amendment	July 11, 2024

Microcomputer Principle and Micro-controller Experiments

Module designation	Microcomputer Principle and Micro-controller Experiments
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	Microcomputer Principle and Micro-controller Technology
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the architecture and interface technologies of typical microcomputer application systems. 2. Understand the working principles of control systems and their hardware-software co-design requirements. 3. Learn the functional characteristics of simulation tools and development platforms ● **Skill:** 1. Ability to design hardware-software integrated control systems. 2. Ability to build and debug experimental systems using simulation tools or physical platforms. 3. Ability to program and test microcontroller-based applications. 4. Ability to validate experimental results through systematic data analysis. ● **Competence:** 1. Integrate theoretical knowledge with practical constraints to solve complex engineering problems. 2. Extract core technical issues from system behaviors and propose targeted solutions. 3. Communicate design concepts clearly through technical reports or oral presentations.
Content	**Part A. Theoretical teaching** (0 hour) **Part B. Experiment teaching** **Chapter 1 First encounter with development tools** **Chapter 2 Human-machine Interface Experiment 1** **Chapter 3 Human-machine Interface Experiment 2** **Chapter 4 External interruption experiment** **Chapter 5 Timing/counter experiment**

	Chapter 6 Serial Port Communication Experiment **Chapter 7 Traffic light control experiment**
Examination forms	Course Essay
Study and examination requirements	Experimental report (60%) + result-oriented assessment (40%).
Reading list	**1.Required books** [1] Li Jinghua et al. Principles of Microcomputers and Single-Chip Microcomputer Technology (2nd Edition) [M]. Beijing: Publishing House of Electronics Industry, 2023.
Data of last amendment	July 11, 2024

Automatic Control Theory

Module designation	Automatic Control Theory
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Mao Mingxuan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 56 hours Including: Theoretical teaching: 48 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 105 hours Contact hours = 56 hours Self-study hours = 49 hours
Credit points	3.5
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Advanced Mathematics I, Complex Function and Integral Transformation, Fundamentals of Digital Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the core concepts of automatic control systems. 2. Understand the mathematical modeling methods for control systems. 3. Learn the theoretical foundations of time-domain and frequency-domain analysis. 4. Grasp the principles of control system performance metrics. ● **Skill:** 1. Ability to model physical systems into control-theoretic frameworks. 2. Ability to analyze system stability and dynamic behaviors using Nyquist criteria or root locus techniques. 3. Ability to design basic correction devices to meet performance specifications. 4. Ability to simulate control systems via analog circuits or software tools, and safely operate instruments for data measurement. ● **Competence:** 1. Integrate theoretical analysis with practical constraints to solve engineering problems. 2. Extract critical parameters from experimental data and validate result repeatability. 3. Communicate technical solutions through structured reports. 4. Innovate control strategies for emerging applications.
Content	**Part A. Theoretical teaching** **Chapter 1 General Concepts of Automatic Control** **Chapter 2 Mathematical Model of Control System** **Chapter 3 Time-domain Analysis Methods for Linear Systems** **Chapter 4 Root Locus Method for Linear Systems** **Chapter 5 Frequency Domain Analysis Methods for Linear Systems** **Chapter 6 Correction Methods for Linear Systems**

	Part B. Experiment teaching **Chapter 1 Typical links and their step responses** **Chapter 2 Second-order system step response** **Chapter 3 Stability analysis of the control system** **Chapter 4 Measurement of system frequency characteristics**
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%, including 20% after-school homework and 20% experiments) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Hu Shousong. Principles of Automatic Control (8th Edition) [M]. Beijing: Science Press, 2023.
Data of last amendment	July 11, 2024

Electromagnetic Fields in Engineering

Module designation	Electromagnetic Fields in Engineering
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2
Required and recommended prerequisites for joining the module	Advanced Mathematics I, College Physics II（1）
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the fundamental concepts and theories of electromagnetic fields. 2. Understand the mathematical methods for solving electromagnetic field problems. 3. Grasp the analytical approaches to derive electric and magnetic fields from governing equations. ● **Skill:** 1. Ability to apply time-varying field concepts to solve common electromagnetic problems in electrical engineering. 2. Ability to analyze complex electromagnetic phenomena. 3. Ability to utilize mathematical tools for quantitative field solutions. ● **Competence:** 1. Integrate electromagnetic theory with practical engineering scenarios. 2. Innovate solutions by combining field analysis with interdisciplinary constraints. 3. Communicate technical insights effectivelys.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Electrostatic Field** **Chapter 3 Constant Electric Field** **Chapter 4 Constant Magnetic Field** **Chapter 5 Time-Varying Fields** **Chapter 6 Static Fields** **Part B. Experiment teaching** (0 hour)
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%, including 20% homework and 20% regular performance) + result-oriented assessment (60%).

Reading list	**1.Required books** [1] Feng Cizhang. Introduction to Engineering Electromagnetic Fields (Second Edition). Higher Education Press. December 2016.
Data of last amendment	July 11, 2024

Fundamentals of Electrical Engineering

Module designation	Fundamentals of Electrical Engineering
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Hua Guoxiang, Yan Jiyuan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2
Required and recommended prerequisites for joining the module	Major Introduction
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the principles and analytical methods of power generation, transmission, distribution, and consumption in electrical engineering. 2. Understand the fundamentals of power system steady-state and short-circuit fault calculations. 3. Grasp the design principles of electrical main wiring and the basic theory of power system relay protection. ● **Skill:** 1. Ability to apply analytical methods to support main wiring design and data analysis in renewable energy generation and smart microgrids. 2. Ability to identify critical parameters and links in complex engineering problems. 3. Ability to design basic electrical main wiring schemes and evaluate relay protection strategies. ● **Competence:** 1. Integrate theoretical knowledge with practical constraints to solve cross-domain challenges. 2. Innovate solutions by combining power system analysis with emerging technologies. 3. Communicate technical decisions effectively.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Power Generation System** **Chapter 3 Transmission and Transformation System** **Chapter 4 Power Distribution System** **Chapter 5 Power System Load** **Chapter 6 Steady-state Calculation of Power Grid** **Chapter 7 Operation of Modern Power Systems**

	Chapter 8 Short Circuits in Power Systems **Chapter 9 Relay Protection of Power Systems** **Part B. Experiment teaching** (0 hour)
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (30%, including 15% course participation and 15% after-class assignments) + result-oriented assessment (70%).
Reading list	**1.Required books** [1] Xiong Xinyin, Zhang Buhan. Fundamentals of Electrical Engineering [M]. Huazhong University of Science and Technology Press, 2022.
Data of last amendment	July 11, 2024

Motor and Drive System

Module designation	Motor and Drive System
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 48 hours Including: Theoretical teaching: 40 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3
Required and recommended prerequisites for joining the module	Circuit Theory, Advanced Mathematics I, College Physics II（1）
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the fundamental laws of electromagnetism and characteristics of ferromagnetic materials. 2. Understand the operating principles and structural features of DC machines and transformers. 3. Grasp the theory of AC motor windings and the operational characteristics of asynchronous motors. ● **Skill:** 1. Ability to analyze and calculate magnetic circuits of ferromagnetic materials. 2. Ability to evaluate the operating characteristics of DC motors. 3. Ability to solve transformer performance issues. 4. Ability to compute AC winding parameters and asynchronous motor behaviors. 5. Ability to design experimental setups and operate instruments. ● **Competence:** 1. Integrate theoretical knowledge with experimental validation. 2. Evaluate experimental results critically. 3. Communicate findings systematically.
Content	**Part A. Theoretical teaching** **Chapter 1 Principles of Electromagnetic Induction and Magnetic Circuit Analysis** **Chapter 2 DC Motors** **Chapter 3 Electric Drive of DC Motors** **Chapter 4 Transformer** **Chapter 5 Common Problems of AC Motors** **Chapter 6 Asynchronous Motors** **Part B. Experiment teaching**

	Chapter 1 Mechanical characteristic test of DC motor **Chapter 2 Single-phase transformer parameter measurement: no-load test** **Chapter 3 Single-phase transformer parameter measurement: Load test** **Chapter 4 Star Angle (Y-▲) starting test of asynchronous motor**
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Tang Tianhao, Xie Wei. Electric Motors and Drive (3rd Edition) [M], Beijing: Machinery Industry Press, 2017. **2.Reference books** [1] Gu Chenglin, Chen Qioff, Xiong Yongqian. Electrical Machinery (4th Edition). Wuhan: Huazhong University of Science and Technology Press, 2018. [2] Gu Shenggu Fundamentals of Electric Motors and Drive (4th Edition). Beijing: Machinery Industry Press, 2007.
Data of last amendment	July 11, 2024

Power Electronics

Module designation	Power Electronics
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Mao Mingxuan, Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 48 hours Including: Theoretical teaching: 40 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, Automatic Control Theory
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the working principles and topological structures of common power electronics circuits. 2. Understand the characteristics and selection criteria of key power electronic devices. 3. Grasp the mechanisms affecting system performance. ● **Skill:** 1. Ability to model power electronics circuits mathematically. 2. Ability to analyze circuit behaviors using foundational theories. 3. Ability to simulate power electronic systems with tools like MATLAB/Simulink or PLECS. ● **Competence:** 1. Design main circuits and control/drive circuits for power electronics systems. 2. Validate theoretical models through experimental setups. 3. Interpret experimental data to refine system performance.
Content	**Part A. Theoretical teaching** **Chapter 1 Overview of Power Electronics Technology** **Chapter 2 Power Electronic Devices** **Chapter 3 AC/DC Rectifier Circuits** **Chapter 4 DC/AC Inverter Circuit** **Chapter 5 AC/AC Conversion Circuit** **Chapter 6 DC/DC Conversion Circuit** **Chapter7 PWM Control and Its Application in Power Electronics** **Part B. Experiment teaching** **Chapter 1 Characteristic Experiment of Power Electronic Devices** **Chapter 2 Experiment of Three-phase Bridge Fully Controlled Rectifier Circuit**

	Chapter 3 Experiment of Single-phase Chopping Control AC Voltage Regulating Circuit **Chapter 4 Research on the Performance of DC Chopper Circuits**
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%, including 10% class credits + 10% after-class homework + 10% experiments + 10% mid-term exams) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Wang Zhao 'an, Liu Jinjun. Power Electronics Technology (6th Edition) [M]. Beijing: Machinery Industry Press, 2024.
Data of last amendment	July 11, 2024

Power System Analysis

Module designation	Power System Analysis
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Hua Guoxiang, Yan Jiyuan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 48 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3
Required and recommended prerequisites for joining the module	Fundamentals of Electrical Engineering, Motor and Drive System
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the characteristics and mathematical models of power system components. 2. Understand the principles of per-unit system calculations and their application in parameter normalization. 3. Grasp the relationship between active power/frequency and reactive power/voltage, including frequency/voltage regulation mechanisms. ● **Skill:** 1. Ability to analyze power flow using numerical methods. 2. Ability to calculate short-circuit currents with symmetrical components. 3. Ability to apply computer-aided tools. 4. Ability to design frequency/voltage adjustment strategies. ● **Competence:** 1. Integrate component models into system-level analysis. 2. Optimize power quality by balancing economic and technical factors. 3. Evaluate contingency scenarios.
Content	**Part A. Theoretical teaching** **Chapter 1 Overview of the Power System** **Chapter 2 Equivalent Circuits and Parameters of Power System Components** **Chapter 3 Simple Power Flow Analysis of Power Systems** **Chapter 4 Power Flow Calculation in Complex Power Systems** **Chapter 5 Power Balance and Control of Power Systems** **Chapter 6 Analysis of Three-phase Short Circuit Faults in Power Systems** **Chapter 7 Analysis Methods for Asymmetric Operation of Power Systems**

	Chapter 8 Analysis of Asymmetric Faults in Power Systems **Part B. Experiment teaching** (0 hour)
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (30%, including 15% course participation + 10% after-class homework + 5% mid-term exam) + result-oriented assessment (70%).
Reading list	**1.Required books** [1] Zhu Yilun. Power System Analysis (2nd Edition) [M]. Machinery Industry Press, 2018.
Data of last amendment	July 11, 2024

Power System Relaying Protection

Module designation	Power System Relaying Protection
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2
Required and recommended prerequisites for joining the module	Fundamentals of Electrical Engineering, Motor and Drive System, Power System Analysis
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Master the classification and basic principles of common relay protections. 2. Understand the structure, operation characteristics, and application limitations of relay protections in power components. 3. Grasp the theoretical basis of short-circuit current calculation. ● **Skill:** 1. Ability to calculate short-circuit currents. 2. Ability to set relay parameters. 3. Ability to verify protection coordination logic. ● **Competence:** 1. Design relay protection schemes considering device coordination and constraints. 2. Validate protection logic through simulation tools and experimental platforms. 3. Optimize protection strategies based on data analysis.
Content	**Part A. Theoretical teaching** **Chapter 1 Basic Concepts of Relay Protection in Power Systems** **Chapter 2 Current Protection of Power Grid** **Chapter 3 Distance Protection of Power Grids** **Chapter 4 Longitudinal Protection of Transmission Lines** **Chapter 5 Automatic Reclosing** **Chapter 6 Electrical Equipment and Microcomputer Protection** **Part B. Experiment teaching** **Chapter 1 Experiment of Electromagnetic Current Relay** **Chapter 2 Experiment of Electromagnetic Time Relay** **Chapter 3 Overcurrent protection experiment for 6-10 kV lines**

	Chapter 4 Current protection experiment in the power direction
Examination forms	Closed-book written exam
Study and examination requirements	Regular performance (40%, including 10% classroom credits + 10% after-class homework + 10% experiments + 10% mid-term exams) + result-oriented assessment (60%).
Reading list	**1.Required books** [1] Zhang Baohui. Relay Protection of Power System [M], Beijing: China Electric Power Press, 2018.
Data of last amendment	July 11, 2024

Fundamentals of Mechanical Design

Module designation	Fundamentals of Mechanical Design
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Wang Shengxu
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Engineering Drawing, Metalworking Practice
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic knowledge of general parts and parts selection. 2. Master the working principle and movement characteristics of common mechanisms. 3. Understand the basic knowledge of machine kinematics and the choice of mechanical motion scheme. 4. Understand the basic knowledge of working principle, characteristics, selection and design calculation of general mechanical parts. ● **Skill:** 1. Have the ability to use standards, specifications, manuals, atlas and network information and other related technical materials. 2. Have preliminary design ability of common mechanism, and ability to design simple machinery and mechanical devices. 3. Ability to develop and debug microcontroller application systems. ● **Competence:** 1. Use advanced tools for program design. 2. Structural modeling with advanced tools.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Degree of freedom and velocity analysis of planar mechanism** **Chapter 3 Planar linkage** **Chapter 4 Cam gear** **Chapter 5 Gear mechanism** **Chapter 6 Wheel train** **Chapter 7 Introduction to mechanical parts design** **Chapter 8 Connections** **Chapter 9 Gear drive** **Chapter 10 Worm drive** **Chapter 11 Belt drive and chain drive** **Chapter 12 The Axis** **Chapter 13 The Bearings**

	Part B. Experiment teaching (0 hours)
Examination forms	Closed-book written exam
Study and examination requirements	Homework assessment (40%) + final test (60%)
Reading list	**1.Required books** [1] Yang Kezhen, Fundamentals of Mechanical Design (7th edition) [M], Beijing: Higher Education Press, 2020.
Data of last amendment	July 11, 2024

Artificial Intelligence

Module designation	Artificial Intelligence
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Ji Nan
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Advanced Mathematics I (2), Probability Theory and Statistics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the definitions and historical development of artificial intelligence, including its core research schools. 2. Master the principles and application scenarios of knowledge representation methods. 3. Understand the structure and learning algorithms of artificial neural networks and their foundational differences from deep neural networks.. 4. Recognize the key application domains of AI technologies. ● **Skill:** 1. Use technical standards, manuals, and frameworks to implement basic neural networks. 2. Design knowledge representation models and validate logical consistency. 3. Develop and debug simple AI-driven systems. ● **Competence:** 1. Use advanced tools for program design and simulation of AI algorithms. 2. Perform structural modeling of complex systems with advanced software. 3. Evaluate ethical risks and propose mitigation strategies in AI deployment.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Knowledge representation methods** **Chapter 3 Inference methods** **Chapter 4 Search strategy** **Chapter 5 Artificial neural network** **Part B. Experiment teaching** **Chapter 1 Basics of MATLAB Programming** **Chapter 2 BP neural network electrical engineering design**

	Chapter 3 BP neural network electrical engineering design
Examination forms	Course Essay
Study and examination requirements	Class discussion and after-school feedback performance (40%, including 10% discussion during class hours + 10% homework + 20% experiment) + results assessment (60%)
Reading list	**1.Required books** [1] Zhang Yangsen, Huang Gaijuan. Artificial Intelligence Course (2nd Edition) [M]. Beijing: Higher Education Press, 2016.
Data of last amendment	July 11, 2024

Energy Storage Technology and Application

Module designation	Energy Storage Technology and Application
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Li Ye
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Circuit Theory, Fundamentals of Analog Electronics, Power Electronics
Module	Learning outcomes:

objectives/intended learning outcomes	● **Knowledge:** 1. Understand the basic concepts, technical characteristics, system components, and recent advancements of major energy storage technologies. 2. Master the application principles of energy storage technologies in power systems, including their working mechanisms and operational constraints. 3. Understand the fundamental knowledge of design principles, selection criteria, and performance evaluation methods for energy storage equipment and systems. ● **Skill:** 1. Have the ability to use technical standards, specifications, manuals, and engineering tools to analyze the technical characteristics of energy storage systems in power grids. 2. Develop preliminary design solutions for energy storage systems based on scientific thinking and engineering principles. 3. Ability to identify and address key challenges in complex engineering problems related to energy storage applications. ● **Competence:** 1. Use advanced simulation tools for program design and structural modeling of energy storage systems. 2. Demonstrate comprehensive capability in the research, development, operation, and management of energy storage projects. 3. Evaluate and optimize the integration of energy storage technologies with power systems through multi-disciplinary collaboration and ethical considerations.
Content	**Part A. Theoretical teaching** **Chapter 1 Energy storage technology overview** **Chapter 2 Electrochemical energy storage technology**

	Chapter 3 Mechanical energy storage technology **Chapter 4 Electromagnetic energy storage technology** **Chapter 5 Hydrogen energy storage technology** **Chapter 6 Application of energy storage technology** **Chapter 7 Economic analysis of energy storage applications** **Part B. Experiment teaching** **Chapter 1 Charge and discharge control circuit design** **Chapter 2 Charge and discharge experiment of supercapacitor energy storage system** **Chapter 3 Economical analysis and evaluation experiment of energy storage system**
Examination forms	Closed-book written exam
Study and examination requirements	Normal performance (40%) + outcome assessment (60%)
Reading list	**1.Required books** [1] Mei Shengwei, Li Jianlin, Zhu Jianquan. Energy Storage Technology [M], Beijing: China Machine Press, 2023.
Data of last amendment	July 11, 2024

Engineering Ethics

Module designation	Engineering Ethics
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 16 hours Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1
Required and recommended prerequisites for joining the module	Ideology, Morality and the Rule of Law
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Adapt to the requirements of the economy and society, understand the professional ethics and ethical responsibilities of engineers, master the ethical guidelines of the profession and the applicable laws and

	safety standards of the profession 2. To analyze practical problems by comprehensive use of ethics knowledge, so as to strengthen students' sense of professional mission and moral responsibility. 3. Strengthen the literacy of humanities and social sciences, consciously abide by the engineering professional ethics and norms in the future engineering practice, and fulfill the social responsibility of engineers for public safety and environmental protection. ● **Skill:** 1. Through the teaching of the basic knowledge of engineering ethics and the analysis of case problems in different engineering fields, the students' vision is broadened and the basic background knowledge of engineering is helped to be mastered. 2. Through in-depth discussion and study of cases in class, students are helped to master the basic norms of engineering ethics, improve students 'humanities and social science literacy and social responsibility, so that students can understand and abide by engineering professional ethics and norms in practice oriented to automation, and perform social responsibility. 3. Through group discussion and cooperation, group report and display and other course links, students 'project management, effective communication and teamwork skills are cultivated. ● **Competence:** 1. Enhance students' understanding of the social, health, safety, legal and cultural impacts of professional engineering practice and solutions to complex engineering problems, and understand the responsibilities to be assumed. 2. Students are trained to pay attention to, understand and evaluate the problems of environmental protection, social harmony, economic sustainability, ecological sustainability and human sustainable development in engineering practice. 3. Cultivate students' critical thinking ability, the ability to coordinate and deal with complex contradictions, and comprehensively improve students' ability to analyze and solve engineering ethical problems,

	decision-making ability and way of thinking.
Content	**Part A. Theoretical teaching** **Chapter 1 Summarize** **Chapter 2 Engineering risk** **Chapter 3 Ethics of value in engineering** **Chapter 4 Environmental and professional ethics in engineering** **Part B. Experiment teaching** (0 hour)
Examination forms	Course Essay
Study and examination requirements	Normal grade (50%, including: class attendance 10%+ class discussion 10%+ homework 10%+ class lecture 20%) + outcome assessment (50%).
Reading list	**1.Required books** [1] Engineering Ethics, Li Zhengfeng, Cong Hangqing, etc. Tsinghua University Press, 2016. [2] Concepts and Cases of Engineering Ethics, Charles E. Harris et al. Translated by Cong Hangqing, Shen Qi et al. Beijing Institute of Technology Press, 2006.
Data of last amendment	July 11, 2024

Engineering Economics

Module designation	Engineering Economics
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 16 hours Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1
Required and recommended prerequisites for joining the module	/
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Strength index; Plasticity index; Crystal structure; Solid solution; Iron-carbon alloy. 2. Phase diagram; Heat treatment; Plastic deformation; Processing

	technology. 3. Classification of materials; Part material selection. ● **Skill:** 1. Master the ability of flexibly applying the basic principles and methods of engineering economics to carry out economic analysis and evaluation of engineering and technical programmes. 2. Master the ability of reasonably evaluating the impact on the environment and sustainable development of society in the light of the complex issues involved in the management of construction projects. 3. Master the ability of applying the economic evaluation methods learned to make trade-offs between individual investment projects and multiple alternative investment options, as well as to conduct economic analyses of equipment purchase and leasing decisions and replacement decisions. ● **Competence:** 1. Able to accurately express his/her views on professional issues in the field of intelligent manufacturing automation technology, verbally, in manuscripts, diagrams, etc., responding to challenges and understanding the differences in communication with industry peers and the public. 2. Able to analyse and evaluate the social, health, safety, legal and cultural impacts of professional engineering practice in a targeted manner in the light of practical application scenarios of engineering projects involved in the development of smart manufacturing oriented fields, as well as the impacts of these constraints on the implementation of engineering projects involved in control systems, equipment and information processing for smart manufacturing processes, and to understand the responsibilities to be assumed.
Content	**Part A. Theoretical teaching** **Chapter 1 Generality** **Chapter 2 Basic elements of engineering economic analysis**

	Chapter 3 Calculation of time value of investment **Chapter 4 Risk and uncertainty analysis** **Chapter 5 Construction project feasibility study** **Part B. Experiment teaching** (0 hour)
Examination forms	Course Essay
Study and examination requirements	Classroom discussion and after-class feedback performance (40%) + outcome assessment (60%)
Reading list	**1.Required books** [1] Liu Xia, You Xiaoming. Engineering Economics [M], Nanjing: Hohai University Press, 2022.
Data of last amendment	July 11, 2024

Engineering Project Management

Module designation	Engineering Project Management
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1
Required and recommended prerequisites for joining the module	/
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. To enable students to preliminarily understand the nature and main content of this course and the development process of engineering project management at home and abroad. 2. Enable students to initially form the systematic concept of engineering project management, and have a certain understanding of the life cycle of engineering project management and engineering project planning. 3. Enable students to understand the current project organization system in China, the organizational structure of project A and Party B and the organization mode of engineering projects, understand the central position of project managers in management and their quality requirements, and master the scope and level of project organization and coordination. 4. Enable students to understand the main content of the feasibility study of construction projects in China at this stage, and master the calculation of the time value of funds. 5. Students need to understand the tasks and contents of resource management, the production factors of construction projects and their management process, and master the classified management of materials and the selection method of machinery and equipment. 6. Students should master the basic concepts and principles of engineering project quality control, be familiar with the standards of quality management system, master the statistical methods of quality management and quality control in the project construction stage, and be familiar with the quality problems and quality accidents of engineering projects. 7. Enable students to master the classification of engineering project contracts according to contract pricing, review and analysis of engineering contracts, and claim management, get familiar with engineering project contract planning, and understand the forms and procedures of construction project contracts.

	● **Skill:** 1. Cultivate students' self-learning ability, the ability to consult the text and summarize the literature. 2. Develop students' ability to analyze and solve problems. ● **Competence:** 1. Have good cultural literacy and professional ethics. 2. Have good cooperation spirit and teamwork ability.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Project operation environment** **Chapter 3 The role of project manager** **Chapter 4 Project integration management** **Chapter 5 Project scope management** **Chapter 6 Project schedule management** **Chapter 7 Project cost management** **Chapter 8 Project quality management** **Part B. Experiment teaching** (0 hour)
Examination forms	Course Essay
Study and examination requirements	Regular grades (30%, including course performance 10%+ course work 20%) + results assessment (70%).
Reading list	**1. Required books** [1] Huang Kun, Zhang Jian. Engineering Project Management [M]. Beijing: Tsinghua University Press, 2019. 2. **Reference books** [1] Zhong Jingbing. Engineering Project Management [M]. Wuhan: Huazhong University of Science and Technology Press, 2009.

	[2] Project Management Institute. Project Management Body of Knowledge Guide (PMBOK Guide) 6th edition [M]. Beijing: Publishing House of Electronics Industry, 2018.
Data of last amendment	July 21, 2024

Engineering Creativity

Module designation	Engineering Creativity
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching, Experiment teaching Contact hour: 16 hours Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1
Required and recommended prerequisites for joining the module	/
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. This course aims to develop students' innovative awareness and creative thinking ability. 2. Through learning, students will learn how to identify problems, come

	up with innovative solutions, and engage in effective thinking training. 3. The course will guide students to think outside the traditional mode, stimulate their imagination and creativity, and lay a solid foundation for solving practical engineering problems. ● **Skill:** 1. The course emphasizes the application of theoretical knowledge to practice, and students will participate in various innovative projects to deepen their understanding and application of theoretical knowledge through practical operations. 2. This practice-oriented approach helps students improve their ability to solve complex problems in real or simulated work environments. ● **Competence:** 1. Students will learn how to use creative thinking to identify problems, propose solutions, and conduct proof of concept. 2. Through practical projects, students will acquire the ability to apply theoretical knowledge to practical engineering problems. 3. Students will learn how to plan, organize, and manage engineering projects to ensure they are completed on time, on budget, and on quality. 4. In team projects, students will develop collaboration and communication skills and learn how to work effectively in multi-disciplinary teams. 5. Students are encouraged to develop the ability to learn independently, laying the foundation for their future career and personal development
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction to creative science** **Chapter 2 Creativity and its development** **Chapter 3 Creative thinking and training** **Chapter 4 Principles and techniques of creation** **Part B. Experiment teaching** (0 hour)

Examination forms	Course Essay
Study and examination requirements	Normal grade (50%, including: class attendance 10%+ class discussion 10%+ homework 10%+ class lecture 20%) + outcome assessment (50%).
Reading list	**1. Required books** [1] A Concise Course of Applied Creativity, Tan Xiaohong (Ed.), Wuhan University Press, 2014 2. **Reference books** [1] A Concise Course of Creative Studies, edited by Tan Zongmei, Science Press, 2011
Data of last amendment	June 11, 2024

Fundamentals of Information and Communication Network

Module designation	Fundamentals of Information and Communication Network
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Hua Guoxiang
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: Theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hour Size of class: 40-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Advanced Mathematics I (1), Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Understand the basic concepts of communication systems and their applications in power systems. 2. Master the principles of communication system design tailored to power system requirements. 3. Understand the relationship between communication technologies and power system operation. ● **Skill:** 1. Have the ability to analyze and compare communication system schemes for power systems using technical standards, manuals, and industry specifications. 2. Develop preliminary communication system designs based on power system application requirements. 3. Ability to design simulation or experimental plans to validate communication system performance. ● **Competence:** 1. Use advanced tools for program design and structural modeling of communication systems in complex power grid scenarios. 2. Continuously update knowledge on emerging trends in power system communication through independent learning and technical adaptation. 3. Evaluate and optimize communication solutions under evolving technical conditions.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction to power system communication technology** **Chapter 2 Basic theory of communication technology** **Chapter 3 Power optical fiber communication technology** **Chapter 4 Power line carrier communication technology** **Chapter 5 Power microwave communication technology and satellite communication technology**

	Chapter 6 Power communication network technology **Chapter 7 Communication facilities for power plants/substations** **Chapter 8 Communication technologies in the Smart Grid/Energy Internet** **Chapter 9 The prospect of power communication and information security technology**
Examination forms	Course Essay
Study and examination requirements	Normal performance (40%, including normal performance 20%+ homework 20%) + results assessment (60%).
Reading list	**1.Required books** [1] Tang Fei, LIU Dichen, Power System Communication Engineering (2nd Edition) [M], Wuhan: Wuhan University Press, 2017.
Data of last amendment	July 11, 2024

General English (1)

Module designation	General English (1)
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Wei wen
Language	English
Relation to curriculum	Compulsory
Teaching methods	Target students: non foreign language undergraduate students Type of teaching: theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 48 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. The basic vocabulary required for Level 1 of General English, as well as the commonly used phrases composed of these words. 2. The basic grammar knowledge at the discourse level. 3. Articles with difficulty level 1 in General English. ● **Skill:**

	1. Be able to understand English short conversations, reports, and lectures. 2. Be able to smoothly read general articles with moderate language difficulty. 3. Be able to express oneself in English language and writing, adapting to the needs of China's development and international communication. ● **Competence:** 1. Enhance cultural perception and understanding. 2. Understand the humanistic connotations of General English courses, and form a scientific outlook on life, world, and values. 3. Have cross-cultural communication skills and skills in international cooperation.
Content	**Theoretical teaching** **Theoretical teaching** **Chapter 1 Fresh start (Reading and writing)** **Small Actions, Big Results (Viewing, listening and speaking)** **Chapter 2 Digital Campus (Reading and writing)** **Connecting to Nature (Viewing, listening and speaking)** **Chapter 3 Heroes of Our Time (Reading and writing)** **Going Places (Viewing, listening and speaking)** **Chapter 4 Winning Is Not Everything (Reading and writing)** **Music, Music Everywhere (Viewing, listening and speaking)** **General English Test Band 4 Tutoring**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 10%, assignments account for (10%) and phase exam accounts for (30%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	**1.Required books** [1] Zheng Shutang, Ding Yaping, Wu Yong, etc. New Horizons General

	English Reading and Writing Tutorial 1 (3rd Edition) (Ideological and Political Wisdom Edition), [M]. Beijing: Foreign Language Teaching and Research Press, 2020. [2] Lida Baker, Wang Minhua, etc. A New Edition of General English Audio Visual and Oral Tutorial 1 (1st Edition), [M]. Shanghai: Shanghai Foreign Language Education Press, 2023.
Data of last amendment	April 2025

General English (2)

Module designation	General English (2)
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Wei Wen
Language	English
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Automation Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	General English (1)
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Vocabulary, phrases, idiomatic expressions and sentence structures required in CET-2. 2. Sentence structures,accuracy and complexity as well as text structures to meet higher requirements of English learning. ● **Skill:**

	1. To be able to read and understand English articles on general topics and professional fields. 2. To be able to understand daily English conversations, and audio-visual materials with general topics; understand professional courses in English and be able to communicate professional problems in English. ● **Competence:** 1. Master cross-cultural communication skills required for career development. 2. Be able to think critically and form a positive and correct outlook on the world, life and values.
Content	**Part A. Theoretical teaching** **Chapter 1 Language in Mission (Reading and Writing) , Secret Wishes (Viewing, Listening and Speaking)** **Chapter 2 College—The Ladder to Success? (Reading and writing) Changing Climate, Changing Minds (Viewing, Listening and Speaking)** **Chapter 3 Discovery of A New Life Stage (Reading and Writing) Unexpected Discoveries (Viewing, Listening and Speaking)** **Chapter 4 Dance with Love (Reading and Writing) The Business of Style (Viewing, Listening and Speaking)** **Chapter 5 The Money Game (Reading and Writing) Engineered by Nature (Viewing, Listening and Speaking)** **Chapter 6 Less is More (Reading and Writing) Lending a Hand (Viewing, Listening and Speaking)** **Part B. Experiment teaching**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including assignments (20%) and class progress test (30%). Final assessment (closed-book written exam) accounts for 50%.

Reading list	**1.Required books** [1] Zheng Shutang. New Horizon General English (2) [M]. Beijing: Foreign Language Teaching and Research Press, 2022. [2] Lynn Bonesteel,Wang Minhua. Viewing, Listening and Speaking (2) [M]. Shanghai: Shanghai Foreign Language Education Press, 2022.
Data of last amendment	April 2025

General English (3)

Module designation	General English (3)
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Wei Wen
Language	English
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Automation Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	General English (2)
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Vocabulary, phrases, idiomatic expressions and sentence structures required in CET-3. 2. Complex English sentence structures and common text structures to meet higher requirements of English learning. ● **Skill:**

	1. To be able to find and read professional English literature with fast reading skills and reading strategies; To be able to read materials of medium length and difficulty such as articles on general topics published in English newspapers and periodicals. 2. To be able to understand everyday English conversation, to understand audio-visual materials in English with general topic, long length and medium speaking speed on radio, television and other platforms, to be able to understand professional courses in English and be able to communicate professional problems in English. ● **Competence:** 1. Have cross-cultural communication skills required for career development. 2. Be able to think critically and form a positive and correct outlook on the world, life and values.
Content	**Part A. Theoretical teaching** (32 contact hours; 28 self-study hours) **Chapter 1 The Way to Success (Reading and Writing), Bringing Dreams to Life. (Viewing, listening and speaking**） **Chapter 2 Life Stories (Reading and Writing), To the Rescue!**（**Viewing, listening and speaking**） **Chapter 3 When Work Is a Pleasure (Reading and writing), Stress: Friend or Foe?**（**Viewing, listening and speaking**） **Part B. Experiment teaching** (0 contact hours; 0 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including assignments (20%) and class progress test (30%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	**1.Required books** [1] Zheng Shutang. New Horizon General English (3) [M]. Beijing: Foreign Language Teaching and Research Press, 2022.

	[2] Lynn Bonesteel, Wang Minhua. Viewing, Listening and Speaking (3) [M]. Shanghai: Shanghai Foreign Language Education Press, 2022. 2.**Reference books** [1] Zheng Shutang. New Horizon General English (3) Reading and Writing Teachers Book [M]. Beijing: Foreign Language Teaching and Research Press, 2022.
Data of last amendment	April 2025

General English (4)

Module designation	General English (4)
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Wei Wen
Language	English
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Automation Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-60 students
Workload(incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	General English (3)
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. To be able to further consolidate and improve their grammar, vocabulary, textual and pragmatic knowledge and basic English language skills such as listening, speaking, reading, writing and

	translation. 2. To be able to master the correct linguistic methods, lay a good foundation in the language, and be able to apply English practically. Students will be able to meet the high requirements of the General English stage, deeply grasp the rational understanding of English language as a tool, and enhance the scientific spirit. ● **Skill:** 1. Have cross-cultural awareness, understand the common knowledge of English-speaking countries such as society, politics, economy, culture, history, etc., as well as the basic knowledge of English literature. 2. To be able to increase knowledge, expand their horizons, enhance cultural perception and understanding, have certain cross-cultural communication skills, compare different cultures, think deeply about problems, and become talents with a sense of social responsibility, international vision and innovative spirit. ● **Competence:** 1. Students will be able to develop their comprehensive quality in an all-round way, understand the humanistic connotation of General English courses, expand their horizons of understanding problems, shape their correct values. 2. Be able to see individuals, society and the world from multiple perspectives, have a correct world view, outlook on life and values, and improve students' critical thinking, innovative thinking and ability to solve practical problems.
Content	**Part A. Theoretical teaching** (32 contact hours; 28 self-study hours) **Chapter 1** **Life and Logic (Reading and writing)** **Viewing, listening and speaking** **Chapter 2** **Secrets to Beauty (Reading and writing)** **Viewing, listening and speaking**

	Chapter 3 **Why Culture Counts (Reading and writing)** **Viewing, listening and speaking** **Part B. Experiment teaching**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including assignments (20%) and class progress test (30%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	**1.Required books** [1] Zheng Shutang. New Horizon General English (4) [M]. Beijing: Foreign Language Teaching and Research Press, 2022. [2] Lynn Bonesteel, Wang Minhua. Viewing, Listening and Speaking (4) [M]. Shanghai: Shanghai Foreign Language Education Press, 2022. 2.**Reference books** [1] Zheng Shutang. New Horizon General English (4) Reading and Writing Teachers Book [M]. Beijing: Foreign Language Teaching and Research Press, 2022.
Data of last amendment	April 2025

Situation and Policy

Module designation	Situation and Policy
Semester(s) in which the module is taught	1st to 8th semesters
Person responsible for the module	Luo Qiane
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Undergraduate students from all majors in the university Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-100 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. To enable students to understand the current situation and future trends in China's domestic politics, economy, culture and diplomacy.

	2. To enable students to accurately understand the basic theory, basic line and basic strategy of the Party. **3.** To enable students to accurately interpret Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era and understand the vivid practice of socialism with Chinese characteristics for a new era. ● Skill: 1. To enable students to consciously and actively pay attention to domestic and international developments. 2. To enable students to pay keen attention to major events and hot issues at home and abroad, to observe national conditions and public opinion diligently, and to enrich their knowledge and information system constantly. 3. To enable students to improve their ideological and political awareness and enhance their humanistic and scientific literacy. ● Competence: 1. To enable students to firmly establish the "four consciousnesses", firmly establish the "four self-confidence", achieve the "two safeguards", and serve the "two overall situations" "Accurately carry out the lines, guidelines, and policies of the Central Committee of the CPC, and have the ability to observe, analyze, and study a variety of social phenomena in their lives by applying the Marxist stance and viewpoint methodology. 2. Students will be able to correctly face the opportunities and difficulties encountered in the future development, correctly recognize the development trend at home and abroad, correctly recognize the responsibility and historical mission of the times, and be a new man of the times who has the courage to take up the great responsibility of national rejuvenation.
Content	**Chapter 1 Domestic Politics and Culture** **Chapter 2 Domestic Economy and Society** **Chapter 3 Reunification of the Motherland and One country, Two systems** **Chapter 4 International Issues**

Examination forms	Closed book exam or essay
Study and examination requirements	No late arrivals, no early departures, and no unauthorized absences. Online tests are completed by the student alone after each class. Online check-ins, readings, discussions, and classroom performance combine to form the milestone assessment. The milestone assessment accounts for 50% and the final exam accounts for 50%.
Reading list	1.Required books [1] Xi Jinping. Xi Jinping on Governance, Volume 4 [M]. Beijing: Foreign Languages Press, 2022. 2.Reference books [1]Xi Jinping. Xi Jinping on Governance, Volume 3[M]. Beijing: Foreign Languages Press, 2020.
Data of last amendment	July 10, 2023

Ideology and Morality and Rule of Law

Module designation	Ideology and Morality and Rule of Law
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Tian Qixiang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Undergraduate students from all majors in the university Type of teaching: theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 48 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-100 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 4. Having a correct understanding of the Marxist worldview, outlook on life, values, morality, and rule of law. 5. Understand the historical orientation of the development of

	socialism with Chinese characteristics in the new era. 6. Clearly define the goals of the curriculum for new generations to enhance their ideological and moral qualities and legal literacy. ● Skill: 4. Promote the Chinese spirit, enhance the ability to distinguish right from wrong, good and evil, beauty and ugliness, and strengthen self-cultivation. 5. Having the basic ability to apply scientific thinking, moral standards, and legal thinking to dialectically analyze problems. 6. Firmly believing in Marxism, actively cultivating and practicing socialist core values. ● Competence: 3. Faced with difficulties and challenges in life and study, one can establish a positive and enterprising attitude towards life, enhance collectivism and the spirit of serving the people, establish a socialist concept of rule of law, strive to maintain the authority of socialist law, and continuously improve moral cultivation and legal literacy. 4. Strengthen confidence in the path, theory, system, and culture of socialism with Chinese characteristics. 5. Establish lofty ideals and beliefs, as well as a correct worldview, outlook on life, and values, and strive to become a new generation worthy of the great task of national rejuvenation.
Content	**Chapter 1 Introduction** **Chapter 2 Understand the True Meaning of Life and Grasp the Direction of Life** **Chapter 3 "Family, Country, and Youth" - Micro Commentary Calligraphy and Painting Exhibition** **Chapter 4 Pursuing Lofty Ideals and Strengthening Lofty Beliefs** **Chapter 5 Inheriting Fine Traditions and Promoting Chinese Essence** **Chapter 6 "Passing on the Classic of Eternal Times and Praising the New Chapter of China" - Outdoor Classic Recitation** **Chapter 7 Clarify Value Requirements and Practice Value Standards**

	Chapter 8 Adhering to Ethical Standards and Honing Moral Character **Chapter 9 Analysis of Moral and Legal Cases** **Chapter 10 Learning the Thought of Rule of Law and Enhancing the Quality of Rule of Law** **Chapter 11 Learning Report Performance**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including comprehensive performance (10%), project assessment (30%) and mid-term grades (10%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	**1.Required books** [1] She Zhuanghai, Wang Yi. Ideology, Morality, and the Rule of Law [M]. Beijing: Higher Education Press, 2023. 2.**Reference books** [1] Xi Jinping. Flying Youth Dreams in Vivid Practice of Realizing the Chinese Dream [M]. Beijing: foreign language press, 2018.
Data of last amendment	July 10, 2023

Modern Chinese History

Module designation	Modern Chinese History
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Zheng Hongxia
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Computer practice: 0 hours Size of class: 90-110 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Iideological Morality and Rule of Law
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. The historical process and inherent laws of social development in modern and contemporary China. 2. Socialism with Chinese characteristics is the theme of all theories and practices of the CPC since the reform and opening up. 3. Realizing the Chinese Dream of the great rejuvenation of the Chinese nation.

	● Skill: 1. Be able to deeply understand the aspiration of the Chinese people to become prosperous and strong since modern times, as well as their dedication to serve their country. 2. Be able to inherit and carry forward the heroic and tenacious revolutionary spirit and the persistent and sincere dedication spirit of the Chinese people since modern times. 3. Further enhance the ability to apply scientific historical perspectives and historical materialism methods to analyze and evaluate historical issues, distinguish right from wrong in history, and identify the direction of social development. ● Competence: 1. Consciously persist in Xi Jinping's Thought on Socialism with Chinese Characteristics for the New Era. 2. Be able to comprehensively and accurately evaluate the merits and demerits of historical figures and the historical impact of major events. 3. Enhance the sense of identification with Chinese civilization and Chinese spirit.
Content	**Theoretical teaching** (32 contact hours; 28 self-study hours) **Chapter 1 Introduction** **Chapter 2 The Hardships and Struggles of the Chinese Nation after entering Modern Times** **Chapter 3 Early Exploration of National Pathways by Different Social Forces** **Chapter 4 Creation of Works for Modern and Contemporary History Speeches (Recitation)** **Chapter 5 The Xinhai Revolution and the End of Monarchic Dictatorship** **Chapter 6 The Founding of the CPC and the New Situation of the Chinese Revolution** **Chapter 7 The New Path of Chinese Revolution** **Chapter 8 A Review of Personnel in Modern and Contemporary**

	Chinese History **Chapter 9 The Anti-Japanese War of the Chinese Nation** **Chapter 10 Struggle for the Establishment of the New China** **Chapter 11 Recommended for Good Books (Good Articles) on Modern Chinese History** **Chapter 12 The founding of the People's Republic of China and the Exploration of the Road of China's Socialist Construction** **Chapter 13 Reform and Opening up and the Creation and Development of Socialism with Chinese Characteristics** **Chapter 14 Socialism with Chinese Characteristics Has Entered a New Era** **Chapter 15 Historical Melodrama Performances**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including overall performance (10%), project assessment (30%) and mid term grades (10%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	**1.Required books** [1] OuYang Song. Outline of Modern Chinese History (2023 Edition) Key textbooks for Marxist theoretical research and construction projects. [M]. Beijing: Higher Education Press, 2023.

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

Module designation	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Xianfeng Zhu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: theoretical teaching Contact hour: 48 hours Including: Theoretical teaching:48 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Ideology and Morality and Rule of Law, "Four Histories" Education topic, Outline of Modern Chinese History, Basic Principles of Marxism, Introduction to MAO Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: Through the teaching of this course, students can comprehensively grasp and understand the content system, core essence and practical value of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era from the dimensions of theory and practice, history and reality, and

	deeply understand that Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era is Marxism in contemporary China and Marxism in the 21st century are the essence of Chinese culture and Chinese spirit of the times, and a new leap forward in the Sinicization of Marxism, thereby realizing the goal of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era being incorporated into classrooms and teaching materials. ● Skill: Guiguide students to be able to use the basic principles and methods of Marxism to analyze, think about and solve problems, especially to be able to connect with the practical problems of socialism with Chinese characteristics in the new era and conduct comprehensive judgments and comparative analyses, so that students can consciously develop the ability to apply Xi Jinping's new era of China The Thought on Socialism with Characteristics guides the behavior and habits of one's own practice, and cultivates and improves students' theoretical analysis and independent thinking abilities, thereby achieving the goal of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era entering students' minds. ● Competence: Through course study, contemporary college students can consciously use Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era to arm their minds, learn to use the theoretical knowledge they have learned to improve their ability to understand, analyze and solve practical problems, and truly integrate this theoretical achievement into Internalize it in your heart and externalize it in your actions, strengthen your firm belief and lofty sense of mission in building socialism with Chinese characteristics under the leadership of the Communist Party of China and realizing the great rejuvenation of the Chinese nation, strengthen the "four self-confidences", and inspire the majority of college students to have a strong interest in socialism with Chinese characteristics. Confidence in the road, theory, culture and system, establish their lofty ideals and beliefs of unswervingly following the party, and strive to cultivate them into successors and qualified builders of socialism with Chinese

	characteristics.
Content	Theoretical teaching (48contact hours; 42 self-study hours) **Chapter 1 A New Leap forward in the Sinicization of Marxism** (3 contact hours; 3 self-study hours) How Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era was created. How to learn and make good use of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era **Chapter 2 The Overall Task of Upholding and Developing Socialism with Chinese Characteristics** (3 contact hours; 3 self-study hours) Why is it said that the great rejuvenation of the Chinese nation has entered an irreversible historical process? Understanding socialism with Chinese characteristics is the only way to achieve the great rejuvenation of the Chinese nation. How to build a powerful modern socialist country **Chapter 3 Uphold the Party's Overall Leadership** (3 contact hours; 3 self-study hours) The party's leadership is comprehensive, systematic and holistic Why we must uphold the party's leadership **Chapter 4 Adhere to the People-Centered Approach** (3 contact hours; 3 self-study hours) How to promote the all-round development of people and the common prosperity of all people. Why we must insist on people-centeredness How to continuously realize people's yearning for a better life. **Chapter 5 Leading High-Quality Development with New Development Concepts** (3 contact hours; 3 self-study hours) Grasp the new development stage, implement new development concepts, and build a new development pattern.

	How to uphold and improve the basic socialist economic system? **Chapter 6 Comprehensively Deepen Reforms** (3 contact hours; 3 self-study hours) Why we need to comprehensively deepen reforms. How to promote comprehensive and deepening reforms How to build a new pattern of opening up to the outside world **Chapter 7 The Whole Process of Developing People's Democracy** (3 contact hours; 3 self-study hours) The meaning of people's democracy in the whole process Benefits of whole-process people's democracy **Chapter 8 Comprehensive Rule of Law** (3contact hours; 3 self-study hours) Why we need to comprehensively promote the rule of law. How to understand the overall goal of comprehensively governing the country according to law **Chapter 9 Build a Powerful Socialist Cultural Country** (3 contact hours; 3 self-study hours) Why build socialist culture with Chinese characteristics Why should we insist on the guiding position of Marxism in the ideological field? How to enhance national cultural soft power and Chinese cultural influence **Chapter 10 Strengthen Social Construction Focusing on People's Livelihood** (3 contact hours; 3 self-study hours) Why strengthen social construction focusing on people's livelihood How to strengthen social construction focusing on people's livelihood **Chapter 11 Building a Socialist Ecological Civilization**

	(3 contact hours; 2 self-study hours) Why build ecological civilization What kind of ecological civilization should we build? **Chapter 12 Build and Consolidate National Defence and a Strong People's army** (3 contact hours; 2 self-study hours) Why we need to build a strong people's army. How to build and consolidate national defence and a strong people's army **Chapter 13 Comprehensively Implement the Overall National Security Concept** (3 contact hours; 2 self-study hours) Why is ensuring national security a top priority? What is the overall national security concept? How to prevent and resolve major risks **Chapter 14 Adhere to "One country, Two systems" and Promote the Reunification of the MotherlandChapter 15 Promote the Construction of a Community with a Shared Future for Mankind** **Chapter 16 Comprehensively and Strictly Govern the Party**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%, including assignments (20%) and experiment (20%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1.Required books** [1] Curriculum writing team. Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era [M]. Beijing: Higher Education Press, 2023. 2.**Reference books** [1] Xi Jinping. Xi Jinping talks about governance [M]. Beijing: foreign

	language publishing house, 2022.
Data of last amendment	July 10, 2023

Marxism Basic Theory

Module designation	Marxism Basic Theory
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Gao Fei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Undergraduate students from all majors in the university Type of teaching: theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 48 hours Computer practice: 0 hours Size of class: 80-100 students
Workload (incl. contact hours, self-study hours)	Total workload = 90 hours Contact hours = 48 hours Self-study hours = 42 hours
Credit points	3.0
Required and recommended prerequisites for joining the module	Ideology and Morality and Rule of Law
Module objectives/intended learning outcomes	Learning outcomes: **Knowledge:** 1. Understand the basic views of the Marxist theory. 2. Master the Marxist worldview and methodology. 3. Have a correct outlook on life and values, and lay a solid theoretical foundation for consciously adhering to the basic theory, basic line and basic program of the Communist Party of China.

	Skills: 1. Be able to observe and analyze problems with the basic Marxist standpoint and methods. 2. Be able to analyze and understand real-world problems. 3. Be able to use the Marxist theory to analyze problems and have excellent ability of rational judgment. **Competence:** 1. Establish a correct outlook on the world, life and values. 2. Have a correct understanding of lifelong learning. 3. Have the ability to continuously learn and adapt to development. 4. Enhance the sense of social responsibility and professional ethics.
Content	**Chapter 1 Introduction** **Chapter 2 The Materiality of the World and the Laws of Its Development** **Chapter 3 The Nature and Development Law of Cognition** **Chapter 4 Human Society and Its Development Laws** **Chapter 5 The Nature and Laws of Capitalism** **Chapter 6 The Development and Tendency of Capitalism** **Chapter 7 The Development and Laws of Socialism** **Chapter 8 The lofty ideal of communism and its ultimate realization**
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%, including comprehensive performance (10%), project assessment (30%) and mid-term grades (10%). Final assessment (closed-book written exam) accounts for 50%.
Reading list	1.Required books [1] Liu jianjun, Xiong Xiaolin. Basic Principles of Marxism [M]. Beijing: Higher Education Press, 2023.

	2.Reference books [1] Marx and Engels. Selected Works of Marx and Engels [M]. Beijing: People's Publishing House, 1995.
Data of last amendment	July 26, 2023

Introduction to Mao Zedong Thought and Theory of Socialism with Chinese Characteristics

Module designation	Introduction to Mao Zedong Thought and Theory of Socialism with Chinese Characteristics
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Associate Professor Zhang Zuyan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Undergraduate students from all majors in the university Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 32 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-100 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours =32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Ideology and Morality and Rule of Law, Modern Chinese History

Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** The students should Understand the formation and development, scientific system, main content, historical status, and guiding significance of Mao Zedong Thought and the theory of socialism with Chinese characteristics. ● **Skill:** The students should have a good political quality and character, and are able to expand and enhance self-learning ability of the theoretical achievements of Marxism with Chinese characteristics. ● **Competence:** The students can consciously use Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era to arm their minds and the student should be confident in the road, theory, culture and system.
Content	**Theoretical teaching** **Chapter 1 Introduction** **Chapter 2 Mao Zedong Thought and Its Historical Position** **Chapter 3New Democratic Revolution Theory** **Chapter 4: Theory of Socialist Transformation** **Chapter 5: Theoretical Achievements of the Initial Exploration of the Socialist Construction Path** **Chapter 6:Deng Xiaoping Theory** **Chapter 7: The Important Thought of the "Three Represents"** **Chapter 8: The Scientific Outlook on Development**
Examination forms	Closed-book written exam
Study and examination requirements	The assessment of this course insists on combining regular assessment with final assessment, focusing on quality assessment. The regular assessment consists of three parts: performance score, practical score, and mid-term score. The performance score accounts for 10% of the total score, the practical score accounts for 30% of the total score, and the mid-term score accounts for 10% of the total score. The final score accounts for 50% of the total score.

Reading list	**1.Required books** [1] Qing Xuan, Xiao Guiqing. Introduction to Mao Zedong Thought and the Theory of Chinese Socialism with Chinese Characteristics. [M]. Beijing: Higher Education Press, 2023. 2.**Reference books** [1] Zhang Jun. Introduction to Mao Zedong Thought and the Theory System of Socialism with Chinese Characteristics: Expansion and Practice Tutorial [M]. Beijing: Beijing University Press, 2016.
Data of last amendment	July 26, 2023

C Language Programming

Module designation	C Language Programming
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Li Yan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: theoretical teaching, experiment teaching Contact hour: 48 hours Including: Theoretical teaching: 40 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 60-80 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 48 hours Self-study hours = 72 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Acquire essential C programming knowledge required for software development. This includes understanding data types, structured programming methodologies, arrays, functions, pointers, structures, and more. 2. Master the basic programming norms, cultivate students' fundamental abilities to analyze and solve problems, and equip students

	with a solid foundation in C language programming. 3. Automated processing flow. ● **Skill:** 1. Cultivate students' basic abilities in algorithm design, along with a certain level of proficiency in C programming and application development, as well as a degree of competence in module design. 2. Students are required to master the basic framework of programming using the C language and to comprehend the philosophy of structured programming. ● **Competence:** 1. Proficiently utilize the C language integrated development environment to design and debug C programs. 2. Able to analyze and solve simple practical problems using C language programming methods and to test the programs. 3. Master the learning methods for computer language courses, enabling students to flexibly apply programming concepts and techniques to analyze and solve problems in their future studies and professional work.
Content	**Part A. Theoretical teaching** **Chapter 1 Overview of the C Language** **Chapter 2 Data Types, Operators, and Expressions** **Chapter 3 Algorithms and Control Statements** **Chapter 4 Functions** **Chapter 5 Arrays** **Chapter 6 Pointers** **Chapter 7 Preprocessor Directives** **Chapter 8 Structures and Unions** **Chapter 9 File System** **Part B. Experiment teaching**
Examination forms	Closed-Book Computer-Based Exam
Study and examination requirements	After-class assignment shall be done independently by students after each class.

	No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%, including assignments (20%) , Classroom Performance (10%) and experiment (10%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	1. **Reference books** [1] Li Hanguang, Zheng Guansheng. C Language Programming Tutorial [M]. Beijing: Tsinghua University Press, 2015. [2] Tan Haoqiang. C Programming (4th Edition) [M]. Beijing: Tsinghua University Press, 2016. [3] Jeri R. Hanly, Elliot B. Koffman. Problem Solving and Program Design in C (Translation) [M]. Translated by Fang Bo, Pan Rong, Zheng Haihong. Beijing: People's Posts and Telecommunications Press, 2007. [4] Mingri Keji. 282 Classic Programming Examples in C Language [M]. Beijing: Tsinghua University Press, 2012. [5] Mingri Keji. C Language Function Reference Manual [M]. Beijing: Tsinghua University Press, 2012. [6] Su Xiaohong, Wang Yuying, Sun Zhigang. C Language Programming [M]. Beijing: Higher Education Press, 2012. [7] Li Wenxin, Guo Wei, Yu Huashan. Introduction to Programming and Online Practice [M]. Beijing: Tsinghua University Press, 2014.
Data of last amendment	April 2025

Psychological Health Education

Module designation	Psychological Health Education
Semester(s) in which the module is taught	1st-2nd semester
Person responsible for the module	Associate Researcher Liu Cuiying
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation. Type of teaching: theoretical teaching, practice teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. Understand psychology related knowledge and master more psychological laws and phenomena. 2. Master group counseling related techniques and internalize the acquired knowledge or experience into personal knowledge.

	● Skill: 1. Be able to effectively communicate and collaborate with others, and attempt to solve practical problems encountered in interpersonal communication. 2. Be able to actively face and correctly handle various common problems in learning, life, and work. 3. Be able to have a certain level of critical thinking ability, and be able to apply psychology related knowledge to analyze and evaluate psychological phenomena and problems in social life in practical life. ● Competence: 1. Possess a team spirit to promote physical and mental health and self-improvement. 2. Have a correct outlook on life, values, ethics, and law; Having humanistic literacy and a sense of social responsibility. 3. Being able to self-actualize, create a happy life, enhance their self-esteem, self-confidence, rationality, peace, and positive social mentality.
Content	**Part A. Theoretical teaching** **Chapter 1 Introduction to Psychological Health of College Students** **Chapter 2 Common Psychological Distress and Abnormal Psychology among College Students** **Chapter 3 Psychological counseling for college students** **Chapter 4 The Self-Awareness and Cultivation of College Students** **Chapter 5 Personality Development and Psychological Health of College Students** **Chapter 6 Emotional Management for College Students** **Chapter 7 Interpersonal Communication among College Students** **Chapter 8 College Students' Sexual Psychology and Love** **Chapter 9 Stress Management of College Students** **Chapter 10 College students deal with setbacks**

	Chapter 11 Life Education and Coping with Psychological Crisis **Chapter 12 The Psychology of Learning of College Students** **Chapter 13 Career Planning and Ability Development** **Part B. Practice teaching** (8 contact hours; 10 self-study hours)
Examination forms	Opened-book written exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Online theory test accounts for 50%. Offline practice scores accounts for 50%, including performance in class (20%) and opened-book written exam (80%).
Reading list	**1.Required books** [1] Gu Xiaohu. Gao Yuan. Psychological Quality Training of College Stude nts [M]. Nanjing: Nanjing University Press, 2019. **2.Reference books** [1] John Gottman. Nan Silver. What Makes Love Last?: How to Build Trust and Avoid Betrayal [M]. Hangzhou: Zhejiang People's Publishing House, 2018.
Data of last amendment	July 10, 2023

Career Development

Module designation	Career Development
Semester(s) in which the module is taught	1st Semester
Person responsible for the module	Yu Runyang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All Majors Type of teaching: Lecturing, discussion-based teaching, case-based teaching, etc. Contact hour: 16 hours Including: Lecture Hours : 10 hours Extracurricular Learning Hours : 6 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	1. Starting from the meaning and theme of career planning in the context of the new era, guide students to think about career and current academic planning from the perspective of life planning; 2. From the exploration of the professional world, guide students to gain insight into new career trends and obtain environmental resources to promote growth; 3. Explore self-characteristics from the four dimensions of interest, personality, ability, and values, and conduct preliminary career

	positioning; 4. From the study of career decision-making methods, help students learn process management and improve career adaptability; 5. Through the interpretation of the connotation of professional qualities, students are inspired to aspire to become talents, improve their comprehensive qualities and abilities in a targeted manner, and actively combine their personal ideals with the needs of national and social development, so as to bravely shoulder the mission of the times and realize the value of life.
Content	**Chapter 1 Inquiry** **1. Teaching content** **Chapter 2: Investigation** **1. Teaching content** **Chapter 3: Self-establishment** **1. Teaching content** **Chapter 4: Investigation II** **1. Teaching content** **Chapter 5: Pursuit of Excellence** **1. Teaching content**
Examination forms	Examination (open-book, closed-book, etc.) or assessment (interview, short essay, etc.)
Study and examination requirements	The course "Career Planning" is a compulsory public course. The course assessment methods include: classroom learning discussion and course assignments (30%) + final assignments (70%).
Reading list	[1] Huang Tianzhong: Career Experience - Career Development and Planning [M]. Beijing: Higher Education Press, 2015.8. [2] Zhou Ying: Research on Innovation in Cultivating Socialist Core Values of College Students in the New Era [M]. China Book Publishing House, 2019.7.
Data of last amendment	July 2024

Employment Guidance

Module designation	Employment Guidance
Semester(s) in which the module is taught	The 6th Semester
Person responsible for the module	Yu Runyang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All Majors Type of teaching: This course adopts a mixed teaching method combining classroom teaching, students' independent learning, and participation in employment practice. In terms of classroom teaching, teachers introduce cases, explain relevant knowledge points, and organize in-class group discussions, job-hunting scene simulations, etc., to strengthen the teaching effect. Students' independent learning includes watching video materials related to career guidance and relevant online courses. To enhance students' experience, employment practice, including mock interviews, employment and entrepreneurship knowledge competitions, campus job fairs, etc., will be organized. Contact hour: 16 hours Including: Lecture Hours : 10 hours Extracurricular Learning Hours : 6 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 16 hours Self-study hours = 14 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	Career Development
Module	The course aims to help students analyze and accurately grasp the

objectives/intended learning outcomes	current employment situation, and guide them to establish correct outlooks on life, values, employment, and career choice. They will be prepared for job-hunting, reasonably determine target positioning, improve job-searching skills, methods, and techniques, effectively enhance employment competitiveness, and ultimately achieve successful employment.
Content	**Chapter 1: Employment Situation and Environment for College Students** **1.Teaching Contents** **Chapter 2 Employment Policies and Procedures for College Students** **1.Teaching Contents** **Chapter 3 Psychological Preparation for College Students' Employment** **1.Teaching Contents** **Chapter 4 Employment Abilities that College Students Should Possess** **1.Teaching Contents** **Chapter 5 Employment Information and Employment Channels** **1.Teaching Contents** **Chapter 6 Preparation of Job Search Materials for College Students** **1.Teaching Contents** **Chapter 7 Written Tests and Interviews for College Students' Job Search** **1.Teaching Contents** **Chapter 8 Etiquette for College Students in Job Hunting** **1.Teaching Contents** **Chapter 9 Ways of Job Contract Signing for College Students and Precautions** **1.Teaching Contents**
Examination forms	Assessment
Study and examination requirements	The Employment Guidance course is a required course for all majors. The course assessment methods include: Mid-term Assignment and Daily Performance (30%) + Final Assignment (70%).

Reading list	1.Zero Distance to the Workplace - College Student Employment Guidance, compiled by the Beijing Association for Human Resources of Chinese and Foreign Enterprises (HRA), Higher Education Press, December 2014 Edition 2.College Student Employment Guidance Tutorial, Editor-in-Chief: Wang Haitang, Peking University Press, February 2009 Edition 3.College Student Employment Guidance (21st Century Higher Education Series Planning Textbook), Editor-in-Chief: Yao Shuzhi, Northwest University Press, January 2010 Edition
Data of last amendment	December 2024

Innovation and Entrepreneurship Foundation

Module designation	Innovation and Entrepreneurship Foundation
Semester(s) in which the module is taught	3rd-4th semester
Person responsible for the module	Lecturer Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, con-tact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experiment /practice teaching Contact hour: 32 hours Including: Experiment /practice teaching: 32 hours Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronics Fundamentals of Digital Electronics Signals and Systems Microcomputer Principles and Micro-controller Technology
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. The basic concepts and processes of innovation and entrepreneurship. 2. The principles of team formation and management 3. The methods for requirement analysis and feasibility assessment of

	innovation projects. ● **Skill:** 1. Be able to apply professional knowledge to complete project design, system implementation, and optimization. 2. Be able to write technical reports, including requirement analysis, design proposals, experimental data, and summarization. 3. Be able to master teamwork techniques and enhance communication and project management skills. ● **Competence:** 1. Independently explore and solve problems. 2. Comprehensively apply professional knowledge in solving complex electronic system design challenges. 3. Enhance critical thinking skills.
Content	**Experiment /practice teaching:** 60hours (32 contact hours; 28 self-study hours) **Stage 1 Basic concepts** **Stage 2 Topic Selection & Team Formation** **Stage 3 Solution Design & Implementation** **Stage 4 Research Paper Composition** **Stage 5 Progress Presentation**
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. In-class performance and after-class feedback accounts for 30%. Research Paper and presentation performance accounts for 70%.
Reading list	**1. Reference books** [1] Huang Zhiwei, Wang Minghua. Common Circuit Module Development for National Undergraduate Electronic Design Competition (2nd Ed.) [M]. Beijing: Beihang University Press, 2016. [2] Hu Renjie. Selected Design Reports from National Undergraduate Electronic Design Competition [M]. Nanjing: Southeast University Press,

	2021.
Data of last amendment	August 2024

Physical Education

Module designation	Physical Education
Semester(s) in which the module is taught	1st-4th semester
Person responsible for the module	Li Xingchang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation. Type of teaching: theoretical teaching, experiment teaching Contact hour: 144 hours Including: Theoretical teaching: 96 hours Experiment teaching: 48 hours Computer practice: 0 hours Size of class: 40 students
Workload (incl. contact hours, self-study hours)	Total workload = 240 hours Contact hours = 144 hours Self-study hours = 96 hours
Credit points	8.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. Learn about the origin and development of sports. 2. Understand the characteristics of sports. 3. Understand the fitness value of physical activity.

	● Skill: 1. Master the warm-up and relaxation methods of sports. 2. Master the basic technical essentials and practice methods of sports, and basically form competitive skills. 3. Master the prevention and treatment methods of sports injury. ● Competence: 1. Establish a correct view of health and aesthetics, and have the consciousness of lifelong physical exercise. 2. Have the spirit of tenacious struggle, never give up and the sense of abiding by the rules and fair play. 3. Have a sense of social responsibility, national pride and national self-confidence. 4. Students can use the knowledge they have learned, organize simple sports competitions, and have the basic ability to exercise people
Content	**Part A. Theoretical teaching** (96 contact hours; 48 self-study hours) **Part B. Experiment teaching** (48 contact hours; 48 self-study hours) **Chapter 1 Second Class for Freshmen (Skills Practice)** **Chapter 2 Basic Technology** **Chapter 3 Basic Tactics** **Chapter 4 Physical Practice** **Chapter 5 Special Skill Assessment**
Examination forms	Spot Assessment
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 30%, physical fitness assessment accounts for 20% and option skill assessment accounts for 50%.
Reading list	**1.Required books** [1]Yu Hua, Li Xingchang, Liu Qing. College Sports and Health Course [M].

	Beijing: Beijing Sport University Press, 2021. 2.**Reference books** None.
Data of last amendment	July 10, 2023

Military Theory

Module designation	Military Theory
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Associate Professor Zhang tian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation. Type of teaching: theoretical teaching: 36 hours Contact hour: 36 hours Including: Theoretical teaching: 36 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 90-100 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 36 hours Self-study hours =24 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	None

Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. Understand the history of China's national defense and the current situation and development trend of building national defense; be familiar with the basic content of national defense laws and policies; know the nature, mission and guiding ideology of the Chinese People's Liberation Army; be familiar with the main content of building national defense and national defense mobilization strengthen the awareness of building national defense in accordance with the law. 2. Understand the generation and development of military thought; be familiar with the main content, status, function and scientific meaning of China's modern military thought; establish a scientific view of war and methodology. 3. Understand the status quo, characteristics and development trends of the global strategic pattern; get a correct understanding of the current status of China's surrounding security environment and security strategies; enhance the awareness of national security. ● Skill: 1. Be able to understand the application scope of high technology in the military sector, the relationship between high technology and new revolution in military affairs, so as to stimulate the enthusiasm of learning science and technology. 2. Be able to understand the formation and development trend of information- based warfare and its relationship with building national defense; be familiar with the characteristics of information-based warfare; have an international vision 3. Strengthen the sense of national defense; improve the ability to understand and analyze the situation; enhance the awareness of science and national. ● Competence: Upon completion of this course, students will acquire communication and collaboration skills, have team spirit, promote physical and mental health and self-improvement, and have the ideals and convictions to be well-prepared to join the socialist cause with Chinese characteristics.

Content	**Part A Theoretical teaching(36 contact hours; 24self-study hours)** **Chapter 1 China's National Defense** **Chapter 2 National Security** **Chapter 3 Military Concept** **Chapter 4 Modern War** **Chapter 5 Information Equipment** **Part B. Experiment teaching** (0 contact hours; 0 self-study hours)
Examination forms	Open-Book Exam
Study and examination requirements	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%, including assignments (20%) and experiment (20%). Final assessment (Open-Book Exam) accounts for 60%.
Reading list	**1.Required books** [1] Zhang zhengwen, Lu hua. Military Theory Tutorial [M]. Nanjing: Nanjing university Press, 2023.

Social Practice

Module designation	Social Practice
Semester(s) in which the module is taught	1st-8th semester
Person responsible for the module	Yu Runyang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation. Type of teaching: on-site guidance Contact hour (on-site guidance): 60 hours Size of class: One tutor works with 3-5 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 60 hours Self-study hours = 60 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Complete all courses for semester 1-4
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: Understand the impact of project implementation on society, such as related safety, law and other contents through learning corporate cases. ● Skill: Understand the employment environment, situation and future personal development path in the mechanical engineering field. ● Competence: Capable of understanding the relationship between enterprise engineering solutions and environmental, social and sustainable development.
Content	**Stage 1 The Choice of Internship Company**

	● Selection of enterprises (units) for practice investigation: The school will contact relevant enterprises of the internship base in advance to determine the enterprises (units) and positions. Students can also choose their own business interests and contact them themselves or with the assistance of the college. **Stage 2 Determination of Instructor** ● The company where the students practice arranges a technician as the instructor of the students' practice, and arranges a teacher to follow the whole process. During the internship, students should keep in touch with the instructor at all times. **Stage 3 On-site Internship** (30contact hours; 30 self-study hours) ● It mainly adopts the way of on-site teaching and professional guidance. Through the practice unit of the master apprentice form to follow the class, learn from the master, you can also through the instructor and the relevant personnel of the practice unit to guide, visit, listen to lectures and other forms to understand the situation.
Examination forms	/
Study and examination requirements	Final score depends on internship reports.
Reading list	1. Required books [1] Xu Guocheng. Social Practice Course for College Students [M]. Hangzhou: Zhejiang University Press, 2021. 2. Reference books [1] Chen Yuanyuan. Handbook of College Students' Social Practice [M]. Beijing: China Agricultural University Press, 2018.
Data of last amendment	July 10, 2023

Labor Studies for College Students

Module designation	Labor Studies for College Students
Semester(s) in which the module is taught	1st、3rd、5th、7th semester
Person responsible for the module	Yu Runyang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation Type of teaching: practice teaching Contact hour: 32 hours Including: Experiment teaching: 32 hours Size of class: 20-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 32 hours Self-study hours = 28 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	none
Module objectives/intended learning outcomes	Learning outcomes: ● Knowledge: 1. Establishing a Correct Labor Concept. 2. Understand and understand that labor creates value. ● Skill: 1. Cultivating skills for future labor in the era of artificial intelligence.

	2. Respect workers and labor achievements. ● Competence: 1. Cultivate practical application abilities. 2. Learn to analyze and solve practical problems. 3. Cultivate the ability of teamwork and the spirit of hardworking craftsmanship.
Content	**Chapter 1 Daily Labor** (8 contact hours; 8 self-study hours) Labor practice projects carried out in daily life. Winter and summer household chores, campus dormitory hygiene, and housekeeping. Weekly campus voluntary labor. **Chapter 2 Productive Labor** (8 contact hours; 8 self-study hours) Participate in agricultural and industrial training to the best of one's ability in labor places such as fields, workshops, and construction site. Participate in labor practices organized by the school, such as Happy Farm and Colorful Campus. Combining professional characteristics and advantages, carry out internships, practical training, professional services, etc. outside of the teaching plan. **Chapter 3 Service Oriented and Creative Labor** (8 contact hours; 6 self-study hours) Social practice activities such as "Youth Red Dream Building Journey" and "Three Visits to the Countryside". Volunteer service labor such as legal aid, compulsory maintenance, emergency rescue, environmental protection, etc. Participate in innovation and entrepreneurship activities and various technological innovation competitions.

	Chapter 4 Characteristic Labor (8 contact hours; 6 self-study hours) Special labor practice projects focused on the development of labor education. Regularly release a library of characteristic labor practice projects for students to choose from.
Examination forms	Using a point system, the maximum score is 100 points, and 60 points are qualified. By participating in various labor education practice activities and passing the assessment, one can earn labor practice points, which will be accumulated in the seventh semester.
Study and examination requirements	40 points for daily labor, 5 points per session. 10 points for production labor, 10 points per time. 10 points for service oriented and creative labor, 10 points per time. Characteristic labor, 10 points per time.
Reading list	**1.Required books** [1] Ding Xiaochang and Gu Jianjun. Labor Education for College Students in the New Era [M]. Beijing: Shanghai Jiao Tong University Press, 2021. **2.Reference books** [1] Liu Yourong. Labor Education for College Students in the New Era [M]. Beijing: Higher Education Press, 2021. [2] Zhilin and Luo Jiawen. Theory and Practice of Labor Education for College Students in the New Era [M]. Beijing: Chemical Industry Press, 2020. [3] Fang Yandan and Wei Jiemei. Design of Labor Education Practice Activities [M]. Beijing: Electronic Industry Press, 2020. [4] Weiqin and Wang Zhongzhong. Theory and Practice of Labor Education for College Students in the New Era [M]. Beijing: China Machinery Industry Press, 2021.
Data of last amendment	July 10, 2023

Cognitive Practice

Module designation	Cognitive Practice
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Ji Nan
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: Visit the enterprise, so that students can understand and experience the actual working environment and enhance their understanding and application ability of the professional knowledge they have learned. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 100-120 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Major Introduction
Requirements according to the examination regulations	Only students with practical tasks over 2/3 are allowed to take the exam.
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** Understand the basic composition, function and characteristics of power system. ● **Skills:** Ability to analyze and explain common phenomena and preliminary problems in power system.

	● **Competence:** Have an overall understanding of the power system, establish interest in learning and good professional habits, and enhance the sense of responsibility and mission.
Content	**Power system cognitive practice** Students have an overall understanding of power system and the ability to analyze and explain common phenomena and preliminary problems in power system.
Study and examination requirements and forms examination	Students submit a course design report after the course. Course discussion (40%)+result assessment (60%).
Reading list	**Reference books** [1] Gao Baojun. Introduction to Electrical Engineering and Automation [M]. Beijing: Machinery Industry Press, 2020. [2] Wei Gang, Cao Zhengqin, Wang Jia. Introduction to Electrical Engineering [M]. Chongqing: Chongqing University Press, 2022. [3] Jia Wunchao. Introduction to Electrical Engineering [M]. Xi'an: Xi'an University of Electronic Science and Technology Press, 2014.
Data of last amendment	April 2025

Metalworking Practice

Module designation	Metalworking Practice
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Cao Haixiao
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: using lecturing as a primary teaching method, in combination with classroom exercises and discussion Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2
Required and recommended prerequisites for joining the module	Engineering Drawing
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.

Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Familiarize with the operation and measurement methods of various tools and measuring instruments. 2. Understand the role of benchwork in mechanical manufacturing and maintenance. 3. Understand the basic knowledge of metal cutting processes. 4. Understand the process characteristics, machining range, accuracy, and surface roughness of milling operations. 5. Understand the characteristics and machining range of planing operations. ● **Skills:** 1. Strengthen the cultivation of students' hands-on professional skills. 2. Encourage students to develop the ability and habit of identifying, analyzing, and solving problems independently using acquired knowledge and skills. 3. Foster and emphasize students' innovative thinking and creativity. 4. Integrate teaching content to cultivate students' engineering awareness, product awareness, and quality consciousness, thereby enhancing their engineering competence. ● **Competence:** 1. Possess proper academic aspirations and integrity, and embody scientific spirits such as seeking truth, being pragmatic, and reflecting critically. 2. Understand the social responsibilities of engineers regarding public safety, health, welfare, and environmental protection, and consciously fulfill these responsibilities in engineering practice.

	3. Be able to communicate effectively and collaborate with members of other disciplines.
Content	**Stage 1 Lathe Work** 1. Safety operation regulations for lathe work. 2. Basic knowledge of metal cutting processes. 3. Types of lathes, the composition, movements, transmission systems, and uses of horizontal lathes. 4. Composition and structure of common lathe tools, as well as the main angles of lathe tools and their functions. 5. Characteristics of clamping methods for shaft and disc parts, and the structure and uses of common accessories. 6. Methods for turning external cylindrical surfaces, facing, drilling, and boring. 7. Methods for grooving, cutting, turning tapered surfaces, forming surfaces, and threading. **Stage 2 Bench Work** 1. Safety operation regulations for bench work. 2. The role of bench work in mechanical manufacturing and maintenance. 3. Methods and applications of marking, sawing, filing, drilling, tapping, and threading. 4. Composition, movements, and uses of drilling machines, as well as methods for reaming and countersinking. 5. Basic knowledge of mechanical component assembly.
Study and examination requirements and forms examination	The assessment of the Metalworking Practice course is primarily designed to evaluate students' achievement of the course objectives and their proficiency in various skills. The course grade is composed of three parts: attendance and safe operation (20%), assessment of practical workpieces (50%), and the metalworking practice report (30%).
Reading list	**1. Required books** Wen, Jianping, and Li, Ping. Metal working and practical training. Clamping practical training [M]. Higher Education Press,2019.

Data of last amendment	April 2025

Electrical and Electronic Practice

Module designation	Electrical and Electronic Practice
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: using lecturing as a primary teaching method, in combination with classroom exercises and discussion Contact hour: 60 hours Including: Theoretical teaching: 20 hours Experiment /practice teaching: 40 hours Computer practice: 0 hour Size of class: 40 students
Workload	Total workload = 120 hours Contact hours = 60 hours Self-study hours = 60 hours
Credit points	4
Required and recommended prerequisites for joining the module	Foundational of Digital Electronics, Foundational of Analog Electronics
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.

Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. The construction of intelligent vehicles 2. The methods of electronic circuit design 3. The hardware structure and functions of micro-controllers, 4. The register operations for basic functions as well as the methods for programming and debugging micro-controllers. ● **Skills:** 1. Be able to design signal acquisition and processing circuits, as well as line-following detection and control circuits for intelligent vehicle control systems; 2. Be able to debug the hardware and software of intelligent vehicle steering and speed control systems, collect data, and analyze results; 3. Be able to communicate and collaborate with team members; 4. Be able to independently or collaboratively undertake the design, fabrication, and debugging of intelligent vehicles within a project team, and complete course reports. ● **Competence:** 1. The professional design capabilities and teamwork skills required to solve complex engineering problems such as intelligent vehicle control using micro-controllers and their peripheral circuits 2. A correct professional orientation, a pragmatic professional ethos, and a scientific spirit of inquisitiveness and reflection.
Content	**Experiment /practice teaching:** 120 hours (60 contact hours; 60 self-study hours) **Stage 1 Chassis Installation and Circuit Soldering of the Vehicle** **Stage 2 L298N Driver DC Motor PWM Speed Control Program Design and Testing** **Stage 3 Obstacle Avoidance Control for Intelligent Vehicles**

	Stage 4 Design and Test the Infrared Line-Following Detection Circuit **Stage 5 Schematic Circuits and PCB Design for Intelligent Vehicle** **Stage 6 Assembly and Testing of the Intelligent Vehicle** **Stage 6 Evaluate and Accept**
Study and examination requirements and forms examination	Laboratory reports (3 times) account for 30%. Project test scores account for 30%. Course defense scores account for 30%. Design report accounts for 40%. Laboratory reports shall be done independently by students after stage 2~stage4.The course project and design report are to be completed by groups, with each group typically consisting of two members.The course defense is conducted and graded on an individual basis.
Reading list	**1. Required books** Song Zhiqiang, Chen Yifei, et al. Microcontroller Principles and Applications: A Task-Driven Tutorial Based on C51 + Proteus [M]. Beijing: China Machine Press, 2022. **2. Reference books** [1] Cheng Yuhua. Series of Guidance Books for the National Undergraduate Intelligent Vehicle Competition—System Design [M]. Beijing: Higher Education Press, 2019. [2] Wang Panbao, Fan Yuxiao, et al. Making Intelligent Vehicles. Beijing [M]: Tsinghua University Press, 2018.
Data of last amendment	April 2025

Academic Writing

Module designation	Academic Writing
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Chen Xiaoyan
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: The teaching method is 'research-based quality education'and'heuristic thematic lectures'; and the teaching format is 'multiform interactive communication'. Contact hour: 30 hours Including: Theoretical teaching: 30 hours Experiment /practice teaching: 0 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Major Introduction, General English
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.
Module objectives/intended learning outcomes	Learning Outcomes: ● **Knowledge:** Master the standards, norms, styles and methods of writing scientific and technological theses, understand the data analysis and chart drawing methods involved in scientific and technological theses; understand the types of Chinese patents and the conditions for granting them, the process of patent application, and master the preliminary preparatory

	work for carrying out the patent application, as well as the skills of writing technical delivery letters. ● **Skills:** Ability to obtain information on the latest research trends, development history, key researchers and teams in the field through searching various Chinese and English scientific and technological literature, and ability to write complete scientific and technological papers or technical reports. ● **Competence:** Through the study of this course, possess proper academic aspirations, academic integrity and academic ethics; and possess the spirit of exploration, innovation, co-operation and scientific spirit.
Content	**Stage 1 Basic knowledge and retrieval methods of patents** Definition, classification and importance of patent. The process and requirements of patent application. Basic concepts and skills of patent retrieval. Introduction and practice of patent retrieval websites at home and abroad. **Stage 2 Basic knowledge and retrieval methods of papers** Definition, classification and writing requirements of papers. Basic concepts and skills of paper retrieval. Introduction and practice of paper retrieval database at home and abroad Practical operation: guide students to do practical operation of paper retrieval. **Stage 3 Use of Visio and Mathtype Tools** Basic operation and function introduction of Visio drawing tool. The use and skills of Mathtype formula editor. Application of Visio and Mathtype in Papers and Patents. **Stage 4 Writing and typesetting of patents and papers** Specification and requirements for typesetting of patents and papers. Skills of using typesetting software (such as Word). Common problems and solutions in typesetting.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Course assessment consists of: classroom learning discussions and post-class feedback on performance (40%) + outcome-based assessment (60%)

Reading list	**1. Required books** [1] Yan Maode, Writing Scientific and Technical Papers [M], Mechanical Industry Press Publishing House, 2021. [2] Guo Jin, Sui Xin, etc. Apply for a patent easily [M]. Beijing: Chemical Industry Press, 2018. **2. Reference books** [1] Wang Hongjun. Introduction to Literature Retrieval and Scientific Papers [M]. Beijing: Machinery Industry Press, 2018. [2] Barbara Geistel, et al. Translated by Ren Zhigang. Course of Writing and Publishing Scientific Papers (8th Edition) [M]. Beijing: Electronic Industry Press, 2018. [3] Yao Jie. et al. Textbook on the use of literature retrieval [M]. Beijing: tsinghua university press, 2017. [4] Zhu Jian. Playing with patents in 2 hours [M]. Beijing: Tsinghua University Press, 2016.
Data of last amendment	April 2025

Power Electronics Comprehensive Practice

Module designation	Power Electronics Comprehensive Practice
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Yu Bin
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experimental practice Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Power Electronics
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and practical tasks over 2/3 are allowed to take the exam.
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. Be able to complete the complex engineering design and product development of related equipment in the field of electrical engineering, master the basic design and development methods of each link, and determine the appropriate technical scheme according to the design objectives; 2. Be able to apply the professional knowledge of electrical engineering to complete the scheme design of systems and equipment according to the specific requirements of electrical engineering-related equipment, systems and their control, including information collection, storage and processing; 3. Be able to complete the process flow design of products related to equipment, systems and control in the field of electrical engineering, and embody the sense of innovation in the design; 4. Be able to consider social, health, safety, legal, cultural and environmental constraints in the complex engineering design of related equipment, systems and controls in the field of electrical engineering transmission. ● **Skill:** 1. According to the requirements of related equipment, systems and control systems in the field of electrical engineering, through literature research and theoretical analysis, solutions to related complex engineering problems can be given; 2. Be able to choose the research route and design the experimental scheme according to the system characteristics and application requirements of related equipment, systems and controls in the field of electrical engineering; 3. Be able to use the professional knowledge of electrical engineering to build experimental systems for related equipment, systems and control, carry out experiments safely and reliably, and obtain experimental data effectively; 4. Be able to analyze and explain the experimental results of

	related equipment, systems and controls in the field of electrical engineering, and get reasonable and effective conclusions through information synthesis. ● **Competence:** 1. Be able to use modern instruments, information technology tools, engineering tools and simulation software common in the field of electrical engineering to predict and simulate, and understand its limitations; 2. Be able to reasonably select and use the required software and hardware design and simulation platforms for related equipment, systems and control in the field of electrical engineering, and analyze, calculate and design complex engineering problems; 3. Be able to understand the prediction and simulation of complex engineering problems related to equipment, systems and control in the field of electrical engineering by electronic instruments and professional simulation software, and understand its limitations.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Comprehensive design of AC-DC-DC DC power supply** **Stage 2 Comprehensive design of AC-DC-AC frequency conversion power supply** **Stage 3 Design of DC-DC multiple DC chopper circuits** ●
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Course assessment methods include: experimental process (50%)+ result assessment (50%) (including defense 20%+ experimental report 30%).
Reading list	**1.Required books** [1] Wang Zhaoan et al. Power Electronic Technology [M]. Machinery Industry Press, 2009.

Data of last amendment	April 2025

Motor and Drive Comprehensive Practice

Module designation	Motor and Drive Comprehensive Practice
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experiment teaching Contact hours: 30 hours Including: Theoretical teaching: 0 hour Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Motor and Drive System
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	Knowledge of the main methods, operating principles and characteristics of motor speed control systems. ● **Skills:** Ability to calculate and analyse motor operating characteristic problems and to design motor speed control problems. ● **Competence:** Be able to use modern tools to engage in the calculation, analysis and design of motor speed control systems, and have the comprehensive quality of software programming, model building, system debugging, management and operation and maintenance.
Content	**Experiment /practice teaching:** (30 contact hours; 30 self-study hours) **Stage 1 Building mathematical models** **Stage 2 Building Simulation Models** **Stage 3 Build an experimental system** **Stage 4 Summary**
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Course assessment consists of: usual grade (40%) + outcome-based assessment (60%) (Experimental Report)
Reading list	**1. Required books** None. **2. Reference books** [1] Experimental guide for manufacturers of experimental platforms for motor control technology laboratories.
Data of last amendment	April 2025

Power System Relaying Protection Comprehensive Experiment

Module designation	Power System Relaying Protection Comprehensive Experiment
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Li Weiwei
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: close integration of theoretical knowledge and practical operation through experiments Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Fundamentals of Electrical Engineering, Motor and Drive System, Power System Analysis, Power System Relaying Protection
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.
Module	Learning outcomes:

objectives/intended learning outcomes	● **Knowledge:** 1.To enable students to master the principles, characteristics and parameter setting methods of power system relay protection. 2. To enable students to master the working principle and analysis method of various kinds of relay protection, and be familiar with the typical cases of relay protection technology in the process of power generation, transmission, transformation, distribution and use. ● **Skills:** 1. from relay, current protection, distance protection to longitudinal differential protection, to enable students to establish the development vein of power system relay protection technology of continuous innovation, and to cultivate the ability to use basic knowledge to analyse and solve complex engineering problems. 2. make students master the use of conventional equipment and instruments, cultivate the scientific method of measuring and processing experimental data and the good habit of ensuring the safety of electrical operation, and improve students' awareness of safety protection and practical operation ability. 3. Combining with scientific research projects and engineering projects, students are guided to understand the frontier and bottleneck of the development of relay protection technology of electric power system, so as to lay a solid foundation for further study and work. ● **Competence:** 1. Introduced through the application of engineering cases to arouse students' interest and cultivate their research spirit of refining scientific problems from practical applications. 2. Through the historical evolution of power system relay protection technology, guide students to experience the joy of thinking, improving, innovating and exploring in scientific

	research work, and cultivate students to aspire to become skilled, practical and hard-working national craftsmen. 3. Enhance the sense of teamwork, deeply understand the position and role of individuals and team members in a team, and cultivate students' written and oral language expression and communication skills.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Simulation of Transmission Lines and Electricity Consumption Loads** **Stage 2 Simulation of overcurrent protection for 6-10 kV lines** **Stage 3 Integrated design of three-stage current protection**
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. In-class performance and attendance account for 30%. The quality of experimental reports, including experimental principles, experimental results, and result analysis accounts for 70%.
Reading list	**1. Required books** Yu Qun, Cao Na. Power System Relay Protection Principles and Simulation [M], Beijing: Machinery Industry Press, 2015. **2. Reference books** [1] Zhang Baohui. Power System Relay Protection [M], Beijing: China Electric Power Press, 2018.
Data of last amendment	April 2025

Electrical Engineering Comprehensive Design

Module designation	Electrical Engineering Comprehensive Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Associate Professor Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: case studies and project driven Contact hour: 60 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 60 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 120 hours Contact hours = 60 hours Self-study hours = 60 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Power Electronics Comprehensive Practice, New Energy Generation and Inverter Technology, AC and DC Speed Regulation Comprehensive Design, Motor and Drive Comprehensive Practice
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 and assignment completion rate over 2/3 are allowed to take the exam.
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	1. the general methods and procedures of low voltage distribution technology; 2. the principles and structure of safety protection systems. ● **Skills:** 1. use of various calculations, drawing instruments and tools; 2. preparation of design specifications, engineering drawings. ● **Competence:** 1. have correct values, understand the relationship between the individual and society, and understand China's national conditions; 2. understand the engineering ethics and norms of honesty, fairness and code of integrity, and consciously abide by them in engineering practice; 3. be able to communicate effectively and work co-operatively with members of other disciplines.
Content	**Experiment /practice teaching:** 120 hours (60 contact hours; 60 self-study hours) **Stage 1 Circuit Models and Circuit Laws** **Stage 2 AC circuit analysis** **Stage 3 Fundamentals of Electromagnetic Fields** **Stage 4 Motors and Transformers** **Stage 5 Power electronics** **Stage 6 Principles of Automatic Control** **Stage 7 Microgrids and renewable energy technologies** **Stage 8 Integrated design and practice of electrical systems**
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. The course assessment consists of a regular grade (40%, including 15% course participation + 10% post-course work + 10% laboratory + 5% mid-term exam) + a results-based assessment (60%, submission of a course paper or design report).
Reading list	**1. Required books** Xu Jianjun, Ni Pinghao, Ji Xiaoheng, Wang Wei.

	Comprehensive Design Tutorial for Electrical Engineering [M], Tsinghua University Press, 2008. **2. Reference books** [1] Guo Yecai. Circuit analysis simulation and experiment tutorial [M]. Jiangsu University Press,2020. [2] Zhang Weiping, Modern Power System Analysis [M]. Tsinghua University Press, 2019. [3] Li, Xiaoming, Power Electronics Technology and Applications [M]. Electronic Industry Press, 2018. [4] Wang Haifeng, Microgrid Technology and Intelligent Control [M]. China Electric Power Press, 2021.
Data of last amendment	April 2025

Graduation Practice

Module designation	Graduation Practice
Semester(s) in which the module is taught	7th and 8th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation, Type of teaching: the course adopts a combination of corporate internships and on-site teaching to ensure that students gain practical hands-on experience under the guidance of professional tutors. Contact hour: 120 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 120 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 240 hours Contact hours = 120 hours Self-study hours = 120 hours
Credit points	8.0
Required and recommended prerequisites for joining the module	Employment Guidance, Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, Automatic Control Theory
Module objectives/intended	Learning outcomes: ● **Knowledge:** Understand the basic theories and basic skills of the

learning outcomes	speciality, consolidate the basic knowledge of the speciality; understand the connection between production practice and the speciality courses, promote and verify each other, and form a holistic understanding of the application areas of the speciality. ● **Skills:** To improve analytical skills and the ability to solve practical problems, and to exercise the ability to apply professional knowledge in an integrated manner. ● **Competence:** Possesses a pragmatic attitude and fosters a sense of innovation; possesses a sense of discipline and a rigorous and conscientious work ethic.
Content	**Experiment /practice teaching:** 240 hours (120 contact hours; 120 self-study hours) **Stage 1 Practical preparation and basic operations** (4 contact hours; 4 self-study hours) 1. Theoretical preparation and practical skills training before internship. 2. Safe operation norms and professionalism training. **Stage 2 Practical and integrated design of engineering projects** (116 contact hours; 116 self-study hours) 1. planning and implementation of practical engineering projects. 2. integrated design and problem solving skills.
Study and examination requirements and forms examination	Practice assignment shall be done independently by students after each class. The course assessment consists of the usual grades (50%, including 50% for practicals) + outcome assessment (50%, practical report).
Reading list	**Reference books** [1] Li Ming, Chen Qiang. Internship guide for electrical engineering and its automation [M]. Higher Education Press,

	2021. [2] .Li JH, Wang W. A practical tutorial on electrical engineering and its automation [M]. Tsinghua University Press, 2023. [3] Zhang HF, Liu JG. Comprehensive Practical Training in Electrical Engineering [M]. Mechanical Industry Press, 2022. [4] Wu Jun, Zhang Li. Electrical Engineering Project Design and Practical Training [M]. Electronic Industry Press, 2020.
Data of last amendment	April 2025

PLC Application Innovation Design

Module designation	PLC Application Innovation Design
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Ge Xuejian
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation, Type of teaching: On-site operation instruction. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Principle and Application of PLC
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** Master the basic theory and knowledge of PLC, its working principle and application technology. ● **Skills:** Be able to operate the experimental device according to the

	automation technology experimental programme, carry out relevant experiments, analyse and interpret the experimental results using computer knowledge and system models, and obtain reasonable and effective conclusions through information synthesis. ● **Competence:** Possess proper academic aspirations, academic integrity, and possess a spirit of inquiry, cooperation, and science.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 PLC application course design topic selection and preliminary design** **Stage 2 Lower computer design** **Stage 3 Upper computer design** **Stage 4 Integrated debugging of upper and lower computer, writing design reports**
Study and examination requirements and forms examination	Practice assignment shall be done independently by students after each class. Design milestones (20%, lower computer design (10%) + upper computer configuration interface design (10%)) + outcome assessment (80%, including: work test (30%) + defence (20%) + course report (30%))
Reading list	**Reference books** [1] Zhou Wenjun. Siemens S7-1200/1500 PLC Project Based Tutorial - SCL and LAD Based Programming [M], Beijing: Electronic Industry Press, 2023.
Data of last amendment	April 2025

AC and DC Speed Regulation Comprehensive Design

Module designation	AC and DC Speed Regulation Comprehensive Design
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experimental teaching Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Motor and Drive System
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** To gain an in-depth understanding of the basic principles and mathematical models of AC/DC speed control systems, including the working principles of motors, speed control methods, control strategies, and mathematical descriptions of

	each link of the system. Students will learn how to construct mathematical models of the corresponding links of the system according to the requirements of the mission statement by applying the theoretical knowledge they have learned, and understand the application of these models in the actual system. ● **Skills:** To develop students' engineering design ability, simulation analysis ability and practical operation ability. Students will learn to use Matlab and other simulation software to build the simulation model of the system and conduct simulation verification and analysis to check the feasibility and effectiveness of the design scheme. ● **Competence:** Emphasis is placed on developing students' sense of innovation, teamwork and professionalism. Students will learn to think independently and innovatively in the design process, and propose novel design solutions or improvements. At the same time, through group work to complete the design tasks, students will practice teamwork skills and learn to communicate effectively with others and share the work.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Building mathematical models** (7 contact hours; 7 self-study hours) Combined with the mission statement, based on the relevant theoretical knowledge of the AC/DC speed control system, establish the mathematical model of the corresponding link of the system. **Stage 2 Building Simulation Models** (7 contact hours; 7 self-study hours) On the basis of completing the construction of the mathematical model of each link of the system, build the

	Matlab simulation model of the system, and carry out simulation verification and analysis. **Stage 3 Build a design system** (8 contact hours; 8 self-study hours) After completing the system simulation work, learn to formulate the design route based on the design purpose, design content and equipment (or components) and tools **Stage 4 Summary** (8 contact hours; 8 self-study hours) Acquisition of basic design methodology and operational skills, design and analytical studies, and final design reports.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Usually grade (40%)+ result assessment (60%, experimental report)
Reading list	**Reference books** [1] Guo Yanping, Chen Xiangzhi. AC and DC speed control system[M]. People's Posts and Telecommunications Press, 2019. [2] Zhou, Yuan-Shen. AC and DC Speed Control Systems with MATLAB Simulation. 2nd edition [M]. China Electric Power Press, 2015.
Data of last amendment	April 2025

Micro-controller Application Design

Module designation	Micro-controller Application Design
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Huang Xing
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: Students of Electrical Engineering and Automation Type of teaching: A project-driven approach is used to closely integrate theoretical knowledge with practical exercises. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 30 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Microcomputer Principle and Micro-controller Technology
Requirements according to the examination regulations	Only students with a class attendance rate over 80% and assignment completion rate over 80% are allowed to take the exam.
Module	Learning outcomes:

objectives/intended learning outcomes	● **Knowledge:** 1. understand the working principles, programming and integrated application of various types of resources (I/O, timers, interrupts, serial ports) within a microcontroller; 2. understand the working principle, programming and application of dynamic display of multi-bit parallel digital tubes; 3. understand the working principle, programming and application of row and column keypads. ● **Skills:** 1. ability to develop and apply microcontroller hardware systems; 2. the ability to programme and use common expansion units/chips for microcontroller systems; 3. have the ability to solve practical problems in the co-development of hardware and software of microcontroller system; ● **Competence:** 1. possess proper academic aspirations and academic integrity; 2. have a sense of independent and lifelong learning, the ability to learn continuously and adapt to development, and possess a spirit of exploration, co-operation and scientific spirit.
Content	**Experiment /practice teaching: 60** hours (30 contact hours; 30 self-study hours) **Stage 1 Intelligent car assembly** (4 contact hours; 4 self-study hours) ● Introduction to course design requirements, introduction to the basic principles of intelligent vehicle design; assembly of the vehicle (base plate, motor motor, motor module, motherboard, battery box, power module). **Stage 2 PWM speed regulation and car motion direction control**

	(8 contact hours; 8 self-study hours) ● The L298N motor driver module is used to realise the PWM speed regulation of 2 sets of DC motors, and the control method is designed to realise the movement of the trolley in different directions. **Stage 3 Obstacle Avoidance Function Implementation** (6 contact hours; 6 self-study hours) ● Installation of infrared obstacle avoidance module, complete the circuit connection, and write a programme to control the progress of the car to different directions of the obstacle avoidance. **Stage 4 Car tracking function realisation** (6 contact hours; 6 self-study hours) ● Install the tracking module, complete the circuit connection, and write a programme to implement the trolley tracking function. **Stage 5 Car tracking function realisation** (6 contact hours; 6 self-study hours) ● Add additional functions to the car, such as adding ultrasonic obstacle avoidance function, working mode switching function, etc. (not limited to times); conduct track racing test.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. The course assessment consists of: design milestones (30%, PWM speed control and car motion direction control (10%) + car obstacle avoidance function implementation (10%) + car tracking function implementation (10%)) + outcome assessment (70%, work test (30%) + defence (20%)).
Reading list	**1. Required books** Song Zhiqiang et al. Principle and Application of Single Chip Microcomputer: Task-driven Course Based on C51+Proteus [M]. Beijing: Machinery Industry Press, 2022. Publishing, 2019.

Data of last amendment	April 2024

New Energy Generation and Application Comprehensive Design

Module designation	New Energy Generation and Application Comprehensive Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Ji Nan
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: through classroom teaching, the basic principles, key technologies and application cases of new energy generation and inverter technologies are systematically explained. Through the experimental integrated design teaching, set up special design projects for students to operate, in-depth understanding of the actual working process of power generation system and inverter. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining	New Energy Generation and Inverter Technology

the module	
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 are allowed to participate in the exam.
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. to be able to give solutions to relevant complex engineering problems through literature research and the use of theoretical analyses, etc., according to the system requirements of relevant equipment, systems and control aspects in the field of electrical engineering. 2. be able to select research routes and design experimental programmes according to the system characteristics of relevant equipment, systems and control aspects in the field of electrical engineering and their application needs. 3. to be able to use the professional knowledge of electrical engineering to construct the experimental systems of related equipment, systems and control aspects, to carry out the experiments safely and reliably, and to obtain the experimental data effectively. 4. to be able to analyse and interpret the results of experiments on relevant equipment, systems and control aspects in the field of electrical engineering, and to obtain reasonable and effective conclusions through information synthesis. ● **Skills:** 1. be able to make predictions and simulations using modern instrumentation, information technology tools, engineering tools and simulation software commonly available in the field of electrical engineering and understand their limitations. 2. be able to reasonably select and use the required hardware and software design and simulation platforms for equipment, systems and controls related to the field of electrical

	engineering to analyse, calculate and design complex engineering problems. 3. to be able to understand the prediction and simulation of complex engineering problems of related equipment, systems and controls in the field of electrical engineering by electronic equipment and professional simulation software, and to be able to understand their limitations. ● **Competence:** 1. be able to understand national and industry standard systems, intellectual property rights, industrial policies and laws and regulations relating to equipment, systems and controls in the field of electrical engineering, and to consider the impact of different socio-cultural influences on activities to solve complex engineering problems. 2. be able to analyse and evaluate the social, health, safety, legal and cultural impacts of professional practices and solutions for equipment, systems and controls related to the field of electrical engineering, and to understand the responsibilities to be assumed.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Design of wind turbine systems** **Stage 2 Research on passive network system for wind power supply** **Stage 3 Photovoltaic power generation system converter performance experiment** **Stage 4 Co-operation Experiment of Wind-Solar Complementary Power Generation System**
Study and examination requirements and forms examination	The course assessment includes: classroom learning discussion and post-course feedback performance (40%, including course hours seminar 10% + post-course assignments 10% + experiments 20% in total) + outcome assessment (60%, course design report).
Reading list	**1. Reference books**

	[1] Fu Rong. New energy power generation and control technology [M]. Beijing: China Electric Power Press, 2015.
Data of last amendment	April 2025

Low Voltage Power Distribution Comprehensive Design

Module designation	Low Voltage Power Distribution Comprehensive Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Tian Hao
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: Lecture and discussion, analysis and simulation at the same time. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Power Supply and Distribution Technology
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 are allowed to participate in the exam.
Module	Learning outcomes:

objectives/intended learning outcomes	● **Knowledge:** Through the course, students will be able to synthesize basic knowledge of power system concepts, electrical main wiring, selection of electrical equipment, relay protection, power system tidal current calculations, short circuit calculations, etc., and improve their ability to understand the power system as a whole. ● **Skills:** Through the course, students will have the ability to synthesize and apply basic knowledge of power systems, the ability to plan and design distribution networks, and the ability to solve practical problems. ● **Competence:** Through the course, students will develop a spirit of cooperation and craftsmanship, shape socialist values, and be equipped for lifelong learning.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Fundamentals of Low Voltage Distribution Systems** **Stage 2 Low voltage distribution system design** **Stage 3 Installation and maintenance of low voltage distribution systems**
Study and examination requirements and forms examination	The course assessment consists of: regular grade (50%, including course participation 15% + post-course work 10% + lab 25%) + outcome assessment (50%, course paper)
Reading list	**1. Reference books** [1] Li, M. et al. Comprehensive Design of Low-Voltage Distribution Technology [M]. Electronic Industry Press, 2023. [2] Zhang Haifeng, Modern Low-Voltage Distribution Technology [M]. Electronic Industry Press, 2021. [3] Chen Guanghua, “Power Distribution System Protection and Control” [M]. China Electric Power Press, 2020.

Data of last amendment	April 2025

Energy Storage Technology and Application Comprehensive Design

Module designation	Energy Storage Technology and Application Comprehensive Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Tian Hao
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: The course provides students with a hands-on approach to the design, construction, testing and optimization of energy storage systems through a series of design projects and laboratory activities. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining	Energy Storage Technology and Application

the module	
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 are allowed to participate in the exam.
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** Through the experimental operation, students can apply the theoretical knowledge of energy storage technology to the actual system design and construction, deepen the understanding of the working principle of energy storage technology, and cultivate the ability to solve practical engineering problems. ● **Skills:** Strengthen students' technical practical skills, including the design, construction, testing and optimization of energy storage systems, as well as the development of battery management systems (BMS) and control strategies, so that they will be able to take up engineering and technical positions in the field of energy storage technology upon graduation. ● **Competence:** Students are trained to think creatively during experiments to improve or propose new solutions to existing energy storage technologies, as well as to develop data analysis and evaluation skills to analyze and optimize experimental results in a scientific way.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Battery energy storage system design and charging/discharging performance testing experiments** **Stage 2 Design of supercapacitor energy storage system and test experiment of fast charging and discharging characteristics**

	Stage 3 Experiments on Dynamics Modeling and Control Strategy Development for Flywheel Energy Storage Systems
Study and examination requirements and forms examination	Laboratory Procedure (50%) + Outcome Based Assessment (50%, Defense 20% + Lab Report 30%).
Reading list	**1. Reference books** [1] Huang ZG, Principles and Technology of Energy Storage [M]. China Water Resources and Hydropower Press, 2020. [2] Guo Yun, Chen Bin. Principles and Technology of Energy Storage [M]. Harbin Institute of Technology Press, 2022.
Data of last amendment	April 2025

Winding Wire Design and Processing Test

Module designation	Winding Wire Design and Processing Test
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experimental teaching. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Motor and Drive System
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 are allowed to participate in the exam.
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	Mastery of winding line conductor structure and insulation structure design essentials. ● **Skills:** Knowledge of the key points in the preparation of winding line process validation work instructions and production work instructions. ● **Competence:** Acquire basic skills in test methods and test operations on winding wires.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Winding wire design** (8 contact hours; 8 self-study hours) ● Design principles and calculation methods for winding line conductor structure and insulation structure. **Stage 2 Machining process route design** (12 contact hours; 12 self-study hours) ● Functions and characteristics of winding wire manufacturing equipment; selection of winding wire processing process route. **Stage 3 Test trials** (10 contact hours; 10 self-study hours) ● Evaluation report on the conformity of design and processing of winding wires.
Study and examination requirements and forms examination	Attendance (10%) + Winding wire design (20%) + Winding wire processing (30%) + Test trials (20%) + Reporting (20%)
Reading list	**1. Reference books** Product standards and technical documents of school-enterprise cooperative factories.
Data of last amendment	April 2025

Power Quality Design and Test

Module designation	Power Quality Design and Test
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Guo Chunping
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electrical Engineering and Automation Type of teaching: experimental teaching. Contact hour: 30 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 30 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 30 hours Self-study hours = 30 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Power Electronics
Requirements according to the examination regulations	Only students with class attendance rate over 2/3 are allowed to participate in the exam.
Module objectives/intended	Learning outcomes: ● **Knowledge:**

learning outcomes	According to the mission statement, the corresponding simulation verification of the power quality system can be completed prior to the experimental operation. ● **Skills:** Learn to formulate technical circuits and determine work steps based on design and test purpose, content and equipment. ● **Competence:** Acquire basic methodological and operational skills, conduct analysis and design studies, complete design and test work, and summarize and write technical reports.
Content	**Experiment /practice teaching:** 60 hours (30 contact hours; 30 self-study hours) **Stage 1 Build a simulation model of the power quality system and select components based on the simulation results.** (15 contact hours; 15 self-study hours) ● Combined with the mission statement, based on the relevant theoretical knowledge of power electronics technology, establish the corresponding mathematical model of each link of the power quality system. On this basis, build the Matlab simulation model of the system, carry out simulation verification and analysis, and select components according to the simulation results. **Stage 2 Build a test platform for power quality system and test the results of component selection** (15 contact hours; 15 self-study hours) ● According to the structure of component selection, build a test platform for power quality system and test the results of component selection to see if it meets the operational requirements of the equipment.
Study and examination requirements and forms examination	The course assessment consists of: usual grade (40%) + outcome assessment (60%, design and report).

Reading list	**1. Reference books** Product standards and technical documents of school-enterprise cooperative factories.
Data of last amendment	April 2025

Graduation Design (Dissertation)

Module designation	Graduation Design (Dissertation)
Semester(s) in which the module is taught	7th and 8th semester
Person responsible for the module	Hua Guoxiang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electrical Engineering and Automation. Type of teaching: Theoretical teaching, experiment/practice teaching and computer practice are arranged by instructors on the basis of each student's specific project. Size of class: each instructor teaches 3-8 students.
Workload (incl. contact hours, self-study hours)	Total workload = 840 hours Contact hours = 240 hours Self-study hours =600 hours
Credit points	28.0
Required and recommended prerequisites for joining the module	Complete all theoretical courses and practical courses
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** Demonstrate understanding of knowledge learned from the programme as well as methods of literature review and research. ● **Skill:**

	4. Master the application methods and basic principles of literature retrieval, information query, modern engineering tools and information technology tools. 5. Demonstrate the ability to process and analyse data. 6. Demonstrate the ability to write thesis, design specifications and abstracts. ● **Competence:** 4. Capable of literature retrieval and comprehensive analysis, through the collection of information, literature review, to obtain the latest technical progress in the professional field, to solve the practical problems in the field of mechanical engineering. 5. Be able to consider safety, health, legal, cultural and environmental constraints in the design of structures and processes in the field of mechanical engineering.
Content	**Stage 1 Topic choose** (40 contact hours; 60 self-study hours) ● Relying on the online selection system, teachers set up a prescribed number of questions, and after the subject management review, the topic of the bachelor's degree thesis is open to students. **Stage 2 Research, literature search and program design** **Stage 3 Theoretical analysis and calculation, software and hardware design** **Stage 4 Thesis writing** **Stage 5 Examination of defence qualification** **Stage 6 Archiving of materials** **Stage 7 Graduation defence**
Examination forms	/
Study and examination requirements	Final score include: Advisor Evaluation (30%), review teacher evaluation (30%), defence group evaluation (40%).

Reading list	Papers and other materials related to the subject of the bachelor's degree.
Data of last amendment	August 26, 2024