Wuxi University

Module Descriptions of Electronic Information Engineering

Department of Electronic Information Engineering

School of Electronic Information Engineering

2025

Content

Advanced Mathematics I(1)

Module designation	Advanced Mathematics I(1)
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer 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; (3) Integration by parts; (4) Integration of rational functions. **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	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% Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [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. [4] *Mathematical Analysis (5th edition)*, edited by the Department of Mathematics, East China Normal University, published by Higher Education Press in 2019 [5] *Guide to Complete Solutions of Higher Mathematics Exercises*, edited by the School of Mathematical Sciences, Tongji University, published by Higher Education Press in 2023. [6] *Advanced Mathematics Tutoring,* edited by Sheng Xiangyao, Ge Yanlin, etc., published by Tsinghua University Press in 2013. [7] *Advanced Mathematics (Micro-course Edition, Vol. 1) (2nd ed.)*, edited by Zhang Tao and Yin Junfeng, People's Posts and Telecommunications Publishing House, 2022. [8] *Advanced Mathematics (Vol. 1)*, edited by Wang Shunfeng, Xia Dafeng et al., Higher Education Press, 2013.

	[9] *Advanced Mathematics (Vol. 1)*, edited by Luo Qinglai, Yu Dagang, and Song Baisheng, Southeast University Press, 2003. [10] *Mathematical Analysis (5th ed.)*, edited by the Department of Mathematics, East China Normal University, Higher Education Press, 2019. [11] *Advanced Mathematics Tutorial (Vol. 1)*, edited by Sheng Xiangyao, Ge Yanlin et al., Tsinghua University Press, 2013.
Data of last amendment	August 2024

Advanced Mathematics I(2)

Module designation	Advanced Mathematics I(2)
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Associate Professor 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 = 84hours
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	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. The course assessment comprises: classroom participation and discussions with post-class feedback performance (40%) +

	summative 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. [3] *Advanced Mathematics (Vol. 2)*, edited by Luo Qinglai, Yu Dagang, and Song Baisheng, Southeast University Press, 2003. [4] *Mathematical Analysis (5th ed.)*, edited by the Department of Mathematics, East China Normal University, Higher Education Press, 2019. [5] *Advanced Mathematics Tutorial (Vol. 2)*, edited by Sheng Xiangyao, Ge Yanlin et al., Tsinghua University Press, 2013.
Data of last amendment	August 2024

Linear Algebra

Module designation	Linear Algebra
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Associate Professor 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 I(1)
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	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%(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	3rd semester
Person responsible for the module	Lecturer 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 I(2), 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** **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** This chapter corresponds to sub-objectives 1.6, 2.1, and 2.2 of the course teaching objectives, as well as sub-objectives 3.1, 3.2, and 3.3 of the course educational objectives. **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	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. 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; [3] *Learning Guidance and Exercise Selection for Probability Theory and Mathematical Statistics*, edited by Sheng Zhou and Xie Qianshi, published by Higher Education Press in 2003; [4] *Textbook on Probability Theory and Mathematical Statistics*, edited by Mao Shisong, published by Higher Education Press in2011; [5] *Probability Theory and Mathematical Statistics*, edited by Chen Xiru, published by Higher Education Press in 2009.
Data of last amendment	August 2024

Complex Function and Integral Transformation II

Module designation	Complex Functions and Integral Transforms II
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Associate Professor 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 I(2), 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 Five: Residues and Their Applications** **1. Teaching Content** (1) Isolated singularities; (2) Residues. **Chapter Six: 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	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. 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. [3] *Functions of Complex Variables and Integral Transforms*, compiled by the Department of Mathematics of Huazhong University of Science and Technology, Higher Education Press, 1999 edition. [4] *Functions of Complex Variables and Integral Transforms*, by Gai Yunying and Bao Gejun, Science Press, 2005 edition. [5] *Functions of Complex Variables and Integral Transforms*, compiled by Liu Hong'ai et al., Jiangsu University Press, 2018 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	2nd semester
Person responsible for the module	Lecturer 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 I(1)
Module objectives/intended learning outcomes	Learning through College Physics II(1), it can enable students to have a more systematic understanding and correct understanding of the basic 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. In each teaching link of college physics course, we should not only impart knowledge, but also pay attention to the cultivation of students' ability to analyze and solve problems, the cultivation of students' exploration spirit and innovation consciousness, and strive to realize the coordinated development of students' knowledge, ability and quality in 3 aspects.
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	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. 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. [3] Principles of Physics (Third Edition), edited by Serway & Jewett, Tsinghua University Press, 2004. [4] General Physics (6th Edition), edited by Cheng Shouzhu, Higher Education Press, 2006 [5] "New College Physics Course", edited by Guo Zhenping, Science Press, 2016. [6] "College Physics (Part I)", edited by Liu Bo, Science Press, 2019. 3. Online Learning Resources: Resources of the University Physics Teaching and Research Section: https:// mooc1.chaoxing.com/course/240597803.html
Data of last amendment	August 2024

College Physics II(2)

Module designation	College Physics II(2)
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	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 I(2), College Physics II(1)
Module objectives/intended learning outcomes	By studying the "College Physics II (2)" course, students can gain a systematic understanding and correct comprehension of the basic 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	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. 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. [4] General Physics (6th Edition), edited by Cheng Shouzhu, et al., Higher Education Press, 2006. [5] New College Physics Tutorial, edited by Guo Zhenping, Science Press, 2016. [6] College Physics (Volume I), edited by Liu Bo, Science Press, 2019.
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 II(1)
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

Introduction to Electronic Information Engineering

Module designation	Introduction to Electronic Information Engineering
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Wang Shouyu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 8 hours Including: Theoretical teaching: 8 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 30 hours Contact hours = 8 hours Self-study hours = 22 hours
Credit points	1.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Understand the training objectives, graduation requirements and curriculum of the Electronic Information Engineering program. ● **Course Objective 2:** Understand the technical standard system and industrial policy in this field. ● **Course Objective 3:** Understand the hot issues in the electronics and information engineering related industries. ● **Course Objective 4:** Understanding of the direction of the electronics and information engineering related industries.
Content	**Theoretical teaching** (8 contact hours; 22 self-study hours) **Chapter 1 Introduction to Outline of Electronic Information Engineering**

	(2 contact hours; 5 self-study hours) ● Definition and connotation of electronic information engineering program. ● Development history of electronic information engineering. ● Discipline system and curriculum of electronic information engineering program. ● Application cases of electronic information engineering in various fields. ● Development trends and challenges of electronic information engineering. **Chapter 2 Electronic Information Engineering Technology** (2 contact hours; 5 self-study hours) ● Basic theory of electronic information engineering technology. ● Core technology of electronic information engineering technology. ● Application areas of electronic information engineering technology. **Chapter 3 Electronic Information Engineering Applications** (2 contact hours; 6 self-study hours) ● Overview of electronic information engineering applications. ● Analysis of major application fields. ● Application case studies. **Chapter 4 Electronic Information Engineering Future** (2 contact hours; 6 self-study hours) ● Trends in electronic information engineering. ● Emerging application fields. ● Technology innovation.
Examination forms	Report
Study and examination requirements	After-class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance including assignments and class performance accounts for 40%. Report accounts for 60%.
Reading list	**1. Required books** [1] Wu Lili. Introduction to Electronic Information Science and Technology [M]. Beijing: Machinery Industry Press, 2021. 2. **Reference books**

	[1] Huang Zailu. Introduction to Electronic Information Science and Technology [M]. Beijing: Higher Education Press, 2024.
Data of last amendment	August 2024

Fundamentals of Circuit Analysis

Module designation	Fundamentals of Circuit Analysis
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Lecturer Zhou Qian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 64 hours Including: Theoretical teaching: 48 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 40-60 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	Advanced Mathematics I, College Physics II
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Basic knowledge, fundamental theories, and essential analytical methods of circuits. 2. Analysis of resistive circuits, time-domain analysis of dynamic circuits, and sinusoidal steady-state circuits. ● **Skill:** 1. Be able to master the basic theories and fundamental analysis methods of circuits, and enhance their theoretical literacy in circuit analysis. 2. Be able to apply the basic principles of circuit theory they have acquired to conduct integrated analysis and computation on a variety of circuit types. 3. Be able to analyze practical circuits, develop dialectical thinking skills, and lay a solid foundation for subsequent basic professional

	courses, specialized courses, and scientific research in the field of circuits. ● **Competence:** 1. Master the characteristics of basic circuit components, such as the voltage-current relationships of resistors, inductors, capacitors, independent sources, controlled sources, transformers, etc., and have a profound understanding of the operating laws of electrons in these devices. 2. Have the ability to analyze circuits using the fundamental theorems and laws of circuits. 3. Have the ability to solve circuits using common circuit analysis methods.
Content	**Part A. Theoretical teaching** (48 contact hours; 40 self-study hours) **Chapter 1 Circuit Models and Circuit Laws** (8 contact hours; 8 self-study hours) ● The concept and task of circuit models. ● The development history of circuit analysis. ● The operational process and main functions of circuit analysis. **Chapter 2 Equivalent Transformations of Resistive Circuits** (6 contact hours; 4 self-study hours) ● Equivalent transformations of circuits ● Series and parallel connection of resistors. ● The equivalent transformation between Y-connection and Δ-connection of resistors. ● Series and parallel connection of voltage sources and current sources. ● The two models of practical power sources and their equivalent transformations. **Chapter 3 General Analysis of Resistor Circuits** (6 contact hours; 4 self-study hours) ● The number of independent equations of KCL and KVL. ● Mesh current method. ● Loop current method. ● Node voltage method. **Chapter 4 Circuit Theorem** (7 contact hours; 5 self-study hours) ● Superposition theorem. ● Substitution theorem. ● Thevenin's theorem and Norton's theorem. ● Maximum power transmission theorem.

	Chapter 5 Energy Storage Element (1 contact hours; 1 self-study hours) ● Capacitance. ● Inductive components. ● Series and parallel connection of capacitors and inductors. **Chapter 6 Time Domain Analysis of First-order Circuits** (4 contact hours; 4 self-study hours) ● The equations of dynamic circuits and their initial conditions. ● The zero - input response of a first - order circuit. ● The zero-state response of a first-order circuit. ● The complete response of a first-order circuit. **Chapter 7 Phasor Method** (3 contact hours; 3 self-study hours) ● Complex number. ● Sinusoidal quantity. ● The basis of phasor method. ● Phasor form of circuit laws. **Chapter 8 Analysis of Sinusoidal Steady-State Circuits** (6 contact hours; 4 self-study hours) ● Impedance and Admittance. ● Phasor Diagrams of Circuits. ● Analysis of Sinusoidal Steady-State Circuits. ● Power in Sinusoidal Steady-State Circuits. ● Complex Power ● Maximum Power Transfer **Chapter 9 Circuits Containing Coupled Inductors** (3 contact hours; 3 self-study hours) ● Mutual Inductance. ● Calculations of Circuits Containing Coupled Inductors. ● Ideal Transformer. **Chapter 10 Three-Phase Circuits** (4 contact hours; 4 self-study hours) ● Three-phase circuits. ● Relationship between line voltage (current) and phase voltage (current). ● Calculation of symmetrical three-phase circuits. ● Calculation of asymmetrical three-phase circuits. ● Power in three-phase circuits. **Part B. Experiment teaching** (16 contact hours; 16 self-study hours)

	In order to help students better understand the concepts and principles of circuit analysis, master the processes of circuit design, simulation, and analysis, and improve their practical skills, the following seven typical experimental classes will be arranged: 1. Experiment on the use of electrical instruments. (2 contact hours; 2 self-study hours) 2. Experiment on Kirchhoff's laws. (2 contact hours; 2 self-study hours) 3. Experiment on the superposition theorem. (2 contact hours; 2 self-study hours) 4. Experiment on Thevenin's theorem. (2 contact hours; 2 self-study hours) 5. Experiment on maximum power transfer. (2 contact hours; 2 self-study hours) 6. Experiment on three-phase circuits. (2 contact hours; 2 self-study hours) 7. Random experimental test. (4 contact hours; 4 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignments shall be completed independently by students after each class. No late arrivals, no early departures, and no unauthorized absences. Regular performance accounts for 40%, including course participation 15%, homework 10%, experiments 10%, midterm exam 5%. Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Qiu Guanyuan, Luo Xianjue. Circuit [M]. Beijing: Higher Education Press, 2022. 2. **Reference books** [1] Wang Yanfeng, Yu Baoqi, Yu Guijun. Circuit Analysis [M]. Beijing: Tsinghua University Press, 2024. [2] Li Limin. Fundamentals of Circuit Analysis [M]. Beijing: Mechanical Industry Press, 2019. [3] Wang Xiaohui. Circuit Theory [M]. Beijing: Tsinghua University Press, 2022. [4] Guo Yecai. Circuit Analysis Simulation and Experiment Tutorial [M]. Jiangsu University Press, 2020.
Data of last amendment	August 2024

Fundamentals of Digital Electronic Technology

Module designation	Fundamentals of Digital Electronic Technology
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Lecturer Zhang Jian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 48hours Including: Theoretical teaching: 48 hours Experiment teaching: 0 hours Computer practice: 42 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, Fundamentals of Circuit Analysis, Fundamentals of Analog Electronic Technology
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Master the fundamental knowledge of digital circuits, such as number systems, coding, and logic algebra. 2. Understand the basic structures, working principles, and external static and dynamic logic characteristics of common logic gate circuits and flip-flops. ● **Skill:** 1. Master the methods for analyzing and designing combinational and sequential logic. 2. Be capable of using logic algebra to establish mathematical models of digital circuits and solve logical problems. ● **Competence:** 1. Able to establish corresponding mathematical system models based on practical application needs, and master the methods of analyzing and designing specific systems from a hardware

	perspective to solve complex engineering problems in the field of electronic information. 2. Capable of estimating system performance from an engineering perspective based on the fundamental principles and optimized design methods of combinational logic circuits, sequential logic circuits, pulse generation and shaping circuits, analog-to-digital and digital-to-analog conversion circuits, semiconductor memory circuits, and programmable logic circuits, while understanding the technical standards related to integrated circuits.
Content	**Theoretical teaching** (48 contact hours; 42 self-study hours) **Chapter 1 Fundamentals of Digital Circuits** (2 contact hours; 2 self-study hours) ● Introduction to the digital electronics curriculum and fundamental learning requirements. ● Concepts of analog and digital signals. ● Concepts of number systems and coding systems. **Chapter 2 Basic Logic Gate Circuits** (4 contact hours; 4 self-study hours) ● Fundamental logic operations. ● Basic formulas, theorems, and rules of Boolean algebra. ● Properties of logic functions. ● Algebraic simplification and Karnaugh map simplification methods for logic functions. ● Working principles, logic functions, and external characteristics of TTL and CMOS integrated gate circuits. **Chapter 3 Combinational Logic Circuits** (8 contact hours; 6 self-study hours) ● Analysis methods for combinational logic circuits. ● Design methods for combinational logic circuits. ● Common medium-scale integrated (MSI) combinational logic circuits and their applications. ● Hazards and race conditions in combinational logic circuits. **Chapter 4 Flip-Flops** (6 contact hours; 4 self-study hours) ● Structure, operation characteristics, logic symbols, and functional properties of basic RS flip-flops and synchronous flip-flops. ● Structure, operation characteristics, logic symbols, and functional properties of master-slave flip-flops and edge-triggered flip-flops; conversion of integrated flip-flop logic functions and characteristic parameters.

	● Classification and functional representation of edge-triggered flip-flops; conversion between JK flip-flops, D flip-flops, T flip-flops, and T' flip-flops. **Chapter 5 Sequential Logic Circuits** (8 contact hours; 6 self-study hours) ● Characteristics, fundamental analysis, and design methods of sequential logic circuits. ● Classification and characteristics of counters; design methods for synchronous and asynchronous counters. ● Design methods for arbitrary N-bit counters. ● Counters based on registers and shift registers. **Chapter 6 Generation and Shaping of Pulse Waveforms** (2 contact hours; 2 self-study hours) ● Circuit structure, working principles, and output waveform diagrams of multivibrators. ● Working principles, characteristics, operational analysis, and output waveform diagrams of Schmitt triggers. ● Circuit structure, working principles, output pulse width calculation, and output waveform diagrams of monostable multivibrators; applications of monostable multivibrators. ● Internal circuit structure, working principles, characteristics, and applications of the 555 timer. **Chapter 7 Digital-to-Analog and Analog-to-Digital Converters** (2 contact hours; 2 self-study hours) ● Working principles of digital-to-analog (DAC) and analog-to-digital (ADC) converters. ● Key parameters and classifications of DACs and ADCs. ● Selection and integrated applications of DACs and ADCs.
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 30%, including classroom learning discussion and post class feedback performance. Final assessment (closed-book written exam) accounts for 70%.
Reading list	**1. Required books** [1] Yu Mengtang. A Concise Course on Digital Electronic Technology Fundamentals [M]. Beijing: Higher Education Press, 2018.

	2. **Reference books** [1] Kang Huaguang. Fundamentals of Electronic Technology (Digital Part) [M]. Beijing: Higher Education Press, 2014. [2] Yan Shi. Fundamentals of Digital Electronic Technology [M]. Beijing: Higher Education Press, 2006.
Data of last amendment	August 2024

Experiments for Fundamentals of Digital Electronic Technology

Module designation	Experiments for Fundamentals of Digital Electronic Technology
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Lecturer Zhang Jian
Language	Chinese
Relation to curriculum	This course is a compulsory course for the programme of electronic information engineering. Through this course, students can master their ability to design systems in digital electronic technology. In this course, students complete experimental circuit designs, including consulting electronic component datasheets and working with integrated circuits and electronic components. In addition to fostering students' design and hands-on skills, the course integrates previously learned fundamental and specialized knowledge for comprehensive training, aiming to enhance their research capabilities.
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2
Required and recommended prerequisites for joining the module	Fundamentals of Circuit Analysis, Fundamentals of Digital Electronic 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: ● **Knowledge:**

learning outcomes	1. Master the principles and methods of digital system design. 2. Acquire proficiency in consulting and adhering to usage standards for electronic component datasheets relevant to the course experiments. ● **Skill:** 1. Develop expertise in experimental and research methods for digital electronic technology circuits. 2. Gain competence in the system design of digital electronic technology. ● **Competence:** 1. Enhance students' system design capabilities in digital electronic technology. 2. Improve students' abilities in independent learning, analyzing, and solving experimental problems.
Content	**Experiment /practice teaching** (16 contact hours; 44 self-study hours) **Experiment 1 Basic Logic Gates** (2 contact hours; 10 self-study hours) ● Learn how to use the electronic technology experimental system. ● Test the truth tables of the 74LS00, 74LS04, and 74LS32 chips. ● Determine the logical functions of the chips based on the tested truth tables. **Experiment 2 Tri-State Output Gates** (2 contact hours; 10 self-study hours) ● Test the logical functions of tri-state output gates, build a circuit for time-division data transmission, and verify the results. ● Use tri-state gates for bidirectional data transfer or explore the application of TTL open-collector gates. **Experiment 3: Decoders and Their Applications** (2 contact hours; 8 self-study hours) ● Verify the logical functions of decoders. ● Build a circuit that uses a decoder as a data distributor. **Experiment 4: Data Selectors and Applications** (2 contact hours; 8 self-study hours) ● Test the logical functions of data selectors. ● Use a 4-to-1 data selector to implement an 8-to-1 data selector. **Experiment 5: Combinational Logic Circuit Design**

	(2 contact hours; 8 self-study hours) ● Design a full adder using a binary decoder. ● Design a digital code lock for a safe using specified chips. **Experiment 6: Integrated Circuit Flip-Flops and Their Applications** (2 contact hours; 8 self-study hours) ● Test the logical functions of the dual D flip-flop 74LS74. ● Convert a D flip-flop into a JK flip-flop. **Experiment 7: Shift Registers** (2 contact hours; 8 self-study hours) ● Test the logical functions of the dual D flip-flop 74LS74. ● Design a shift register (ring counter) using D flip-flops. **Experiment 8: Counters** (2 contact hours; 8 self-study hours) ● Test the logical functions of counters, build a circuit, and verify the results. ● Connect two 74LS163 chips to form a two-digit decimal counter.
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. Experimental operation accounts for 40%, experimental report accounts for 30%, and result based assessment accounts for 30%.
Reading list	**1. Required books** [1] Guo Yecai. Digital Electronic Technology Experimental Simulation and Course Design Tutorial [M]. Xi'an: Xi'an University of Electronic Science and Technology Press, 2020. 2. **Reference books** [1] Liu Jiancheng. Electronic Technology Experiment and Design Tutorial [M]. Beijing: Electronic Industry Press, 2016. [2] Gao Wenhuan. Electronic Technology Experiment [M]. Beijing: Tsinghua University Press, 2023. [3] Yu Mengtang. Fundamentals of Digital Electronic Technology [M]. Beijing: Higher Education Press, 2006.
Data of last amendment	August 2024

Fundamentals of Analog Electronic Technology

Module designation	Fundamentals of Analog Electronic Technology
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Associate Professor Wang Qing
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 64 hours Including: Theoretical teaching: 64 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-120 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 64 hours Self-study hours = 56 hours
Credit points	4
Required and recommended prerequisites for joining the module	Advanced Mathematics I, College Physics II, Fundamentals of Circuit Analysis
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Understand the evolution of electronic devices, the differences between analog and digital signals, and the core principles of semiconductor materials and devices (including PN junctions, diodes, bipolar transistors, and FETs). 2. Master the design and analysis of various amplifier circuits—including biasing, small-signal modeling, dynamic performance—and the use of op-amp circuits, filters, and feedback networks. 3. Comprehend the working principles of oscillator circuits (both sinusoidal and non-sinusoidal), power amplifier classifications and applications, as well as the design and operation of DC regulated power supply systems. ● **Skill:** 1. Able to master foundational knowledge in mathematics, natural

	sciences, computing, and engineering sciences, and to use their language tools to describe engineering technical issues. 2. Able to apply the basic concepts, theories, and methods of mathematics, natural sciences, computing, and engineering sciences to mathematically model and solve real-world problems. 3. Able to employ the fundamental principles of mathematics, natural sciences, and engineering sciences to identify and evaluate the key aspects of complex engineering problems in the field of electronic information. 4. Able to utilize circuit knowledge and mathematical modeling methods to explain and describe complex engineering problems. ● **Competence:** 1. Able to understand and master the operating mechanisms of semiconductor devices and provide mathematical descriptions based on fundamental circuit principles. 2. Master the basic principles of amplifier circuits, including negative feedback, oscillators, signal processing, power amplifiers, and DC power supplies. Establish mathematical models for functional electronic circuits using equivalent methods. 3. Utilize nonlinear analysis and small-signal equivalent methods to abstract, simplify, and model various amplifier, feedback, and power circuits, and accurately determine circuit parameters. 4. Select appropriate circuit solutions based on specific design criteria, and possess the ability to analyze, evaluate, and judge circuit systems, extract key aspects from engineering problems, and perform effective analysis and problem-solving.
Content	**Part A. Theoretical teaching** (64 contact hours; 56 self-study hours) **Chapter 1 Introduction** (2 contact hours; 1 self-study hours) ● History of electronic devices and circuits, especially the evolution from vacuum tubes to modern integrated circuits. ● Basic concepts of analog vs. digital signals, characteristics of analog circuits, and major application domains. ● Learning objectives, scope, and requirements of this course. ● Fundamental definitions of analog electronics. ● Overview of major developments in semiconductor technology. **Chapter 2 Semiconductor Devices** (10 contact hours; 9 self-study hours) ● Semiconductor materials, PN junction formation, diodes,

	bipolar transistors, and field-effect transistors (FETs). ● Electrical characteristics, parameters, and circuit applications of common devices. ● Capability of the project managers. ● PN junction operation, diode characteristics, transistor biasing, and FET principles. ● Applying device knowledge to basic circuit examples. **Chapter 3 BJT Amplifier Circuits** (13 contact hours; 12 self-study hours) ● Common-emitter, common-collector, common-base amplifiers, and differential pairs. ● DC operating point, small-signal equivalent circuits, analysis of voltage gain, input/output impedance, bandwidth. ● Establishing and analyzing transistor bias points. ● Building small-signal incremental models for performance evaluation. ● Differential amplifier basics and offset considerations. **Chapter 4 FET Amplifier Circuits** (4 contact hours; 4 self-study hours) ● Common-source, common-drain, and common-gate FET amplifiers. ● DC biasing, small-signal analysis, and dynamic performance indicators (gain, bandwidth, noise). ● Comparison among JFETs, MOSFETs, and their circuit topologies. ● Impact of bias point on amplifier stability and performance. **Chapter 5 Operational Amplifiers** (4 contact hours; 4 self-study hours) ● Operational amplifier architecture, multistage coupling, frequency characteristics, and current mirror circuits. ● Key op-amp parameters: open-loop gain, offset voltage/current, CMRR, bandwidth. ● Internal composition of op-amps and function of each stage. ● Understanding the role of current mirrors and biasing in integrated op-amps. **Chapter 6 Feedback Amplifiers** (7 contact hours; 6 self-study hours) ● Classification of feedback (positive/negative, voltage/current, series/shunt). ● Effects of negative feedback on stability, linearity, distortion, noise, bandwidth, and input/output impedance

	● Self-oscillation conditions. ● Identifying feedback topologies in practical circuits. ● Analyzing how feedback modifies amplifier performance. **Chapter 7 Signal Operations and Processing** (7 contact hours; 6 self-study hours) ● Operational amplifier applications for signal arithmetic (inverting/non-inverting summation, integration, differentiation). ● Active filters (low-pass, high-pass) and voltage comparators. ● Gain calculations for various op-amp configurations. ● Transfer functions of simple active filters. ● Comparator operation and input-output waveform analysis. **Chapter 8 Signal Generation Circuits** (7 contact hours; 6 self-study hours) ● Sine-wave oscillators (RC and LC), phase and amplitude balance conditions for startup/stability. ● Nonsinusoidal wave generators (square, triangular, etc.). ● Understanding Barkhausen criteria for self-sustaining oscillations. ● Building stable oscillators and analyzing waveforms. **Chapter 9 Power Amplifiers** (5 contact hours; 4 self-study hours) ● Basic requirements, biasing classes, and design for higher output power. ● Class B (push-pull) efficiency, distortion, OCL/OTL amplifier topologies. ● Eliminating crossover distortion and measuring amplifier efficiency. ● Analyzing thermal stability and load-driving capability. **Chapter 10 DC Power Supplies** (5 contact hours; 4 self-study hours) ● Main components of DC regulated power systems: transformers, rectifiers, filters, linear regulators. ● Half-wave, full-wave, and bridge rectification, smoothing circuits, and Zener-based or linear regulator design. ● Waveform analysis before and after filtering. ● Parameter calculations for stabilizing output voltages.
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 course participation (25%), assignment (10%) and midterm exam (5%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**Reference books** [1] Tong Shibai, Hua Chengying. Fundamentals of Analog Electronics (6th Edition) [M]. Beijing: Higher Education Press, 2023. [2] Kang Huaguang. Basic Electronic Technology – Analog Part (7th Edition) [M]. Beijing: Higher Education Press, 2021. [3] Du Guoliang, Wu Jianhui. Fundamentals of Analog Electronic Circuits [M]. Beijing: China Machine Press, 2014.
Data of last amendment	August 2024

Experiments for Fundamentals of Analog Electronics Technology

Module designation	Experiments for Fundamentals of Analog Electronics Technology
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Associate Professor Wang Qing
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 80-120 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2
Required and recommended prerequisites for joining the module	Fundamentals of Circuit Analysis Laboratory
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. Explain working principles of diodes, single-stage & differential amplifiers, negative-feedback amplifiers, op-amp analogue computing circuits and active filters. 2. Describe measurement principles of key parameters such as static operating point, voltage gain, input/output resistance, CMRR and filter transfer characteristics. ● **Skill:** 1. Assemble analogue test circuits on breadboard or training platform, wire instruments correctly and acquire waveforms, V-I curves and frequency responses.

	2. Use modern laboratory instruments (oscilloscope, signal generator, digital multimeter, power supply) safely and efficiently. 3. Process experimental data, plot characteristic curves, calculate error and compare with theoretical values. ● **Competence:** 1. Select appropriate components, instruments and measurement methods to verify analogue‑ circuit theory. 2. Identify, analyze and solve typical faults occurring during experiment. 3. Document the whole experimental process in a technically sound report that meets academic writing standards.
Content	**Experiment /practice teaching:** 60 hours (16 contact hours; 44 self-study hours) **Stage 1 Measurement of Diode V‑ I Characteristics** (2 contact hours; 6 self-study hours) ● Observe the function of a current-limiting resistor using a light-emitting diode (LED). ● Determine the type of diode (silicon or germanium) based on its terminal voltage. ● Measure the forward characteristics of the diode. **Stage 2 Single‑ Transistor Common‑ Emitter Amplifier Circuit** (3 contact hours; 8 self-study hours) ● Measure and adjust the static operating point of a common-emitter amplifier. ● Test the amplifier's dynamic parameters. **Stage 3 Differential Amplifier Circuit** (2 contact hours; 6 self-study hours) ● Measure the static operating point. ● Measure the differential-mode voltage gain. ● Measure the common-mode voltage gain. **Stage 4 Negative Feedback Amplifier Circuit** (3 contact hours; 8 self-study hours) ● Measure the static operating point. ● Test the performance parameters of the basic amplifier and negative feedback amplifier. **Stage 5 Applications of Integrated Operational Amplifiers in Analog Signal Processing** (2 contact hours; 5 self-study hours) ● Measure the input/output signal amplitude and waveform of inverting and non-inverting proportional operation circuits. ● Measure the input/output amplitude and waveform of

	inverting and non-inverting summing circuits. ● Measure the input/output amplitude and waveform of subtraction circuits. ● Measure the input/output amplitude and waveform of integrator circuits (optional). **Stage 6 Active Filters** (2 contact hours; 6 self-study hours) ● Measure the output voltage of first-order active low-pass/high-pass filters at different frequencies. ● Measure the output voltage of second-order active low-pass/high-pass filters at different frequencies. **Stage 7 Random Experiment** (2 contact hours; 5 self-study hours) ● Randomly select a previously studied circuit for construction and measurement.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Experimental operation accounts for 40%. Laboratory reports account for 30%. Course assessment accounts for 30%, consisting of: explanation of experimental principles (10%), correct instrument usage and circuit construction (10%), and sound experimental procedures with accurate data and methods (10%)..
Reading list	**Reference books** [1] Tong Shibai, Hua Chengying. Fundamentals of Analog Electronics (6th Edition) [M]. Beijing: Higher Education Press, 2023. [2] Guo Yecai. Simulation Tutorial of Analog Electronic Technology Experiments [M]. Xi'an: Xidian University Press, 2020.
Data of last amendment	August 2024

Signals & Systems I

Module designation	Signals & Systems I
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Professor Wu Li
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students majoring in Electronic Information Engineering Type of teaching: theoretical teaching, experimental teaching Contact hours: 80 hours Including: Theoretical teaching: 64 hours Experimental teaching: 16 hours Computer practice: 0 hours Class size: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 150 hours Contact hours = 80 hours Self-study hours = 70 hours
Credit points	5
Required and recommended prerequisites for joining the module	Circuit Analysis Fundamentals, Analog Electronic Circuits, Advanced Mathematics I.
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Basic concepts of continuous-time and discrete-time signals and systems. 2. Mathematical modeling of signals and systems in time and frequency domains. 3. Application of Fourier and Laplace transforms in signal analysis. ● **Skill:** 1. Ability to analyze and solve problems related to linear time-invariant systems. 2. Proficiency in using mathematical tools for signal processing and system analysis. 3. Basic experimental skills in signal acquisition and processing. ● **Competence:** 1. Apply theoretical knowledge to practical engineering problems

	in the field of electronic information. 2. Develop critical thinking and problem-solving abilities through theoretical and experimental training. 3. Understand the ethical and social responsibilities of engineers in the context of signal and system analysis.
Content	**Part A. Theoretical teaching** (64 contact hours; 64 self-study hours) **Chapter 1 Introduction** (8 contact hours; 8 self-study hours) ● Basic concepts of signals and systems. ● Classification and typical examples of signals. ● Operations of signals. ● Step and impulse signals, decomposition of signals. ● System models and their classification. **Chapter 2 Time-Domain Analysis of Continuous-Time Systems** (4 contact hours; 4 self-study hours) ● Mathematical models of systems (differential equations). ● Classical time-domain solution of differential equations. ● Zero-input response and zero-state response. ● Impulse response and step response. ● Convolution and its properties. **Chapter 3 Fourier Transform** (16 contact hours; 16 self-study hours) ● Fourier series analysis of periodic signals. ● Fourier transforms of typical signals. ● Properties of Fourier transforms. ● Convolution theorem. ● Sampling theorem. **Chapter 4 Laplace Transform and s-Domain Analysis** (14 contact hours; 14 self-study hours) ● Definition and region of convergence of Laplace transform. ● Properties of Laplace transform. ● Inverse Laplace transform. ● System analysis using Laplace transform. ● Stability analysis of systems. **Chapter 5 Application of Fourier Transform in Communication Systems** (4 contact hours; 4 self-study hours) ● System function and its application in signal processing. ● Distortionless transmission. ● Ideal low-pass filters.

	Chapter 6 Time-Domain Analysis of Discrete-Time Systems (6 contact hours; 6 self-study hours) ● Discrete-time signals and systems. ● Difference equations and their solutions. ● Impulse response and convolution sum. **Chapter 7 z-Transform and z-Domain Analysis of Discrete-Time Systems** (12 contact hours; 12 self-study hours) ● Definition and region of convergence of z-transform. ● Properties of z-transform. ● Inverse z-transform. ● System analysis using z-transform. ● Frequency response of discrete-time systems. **Part B. Experiment teaching** (16 contact hours; 6 self-study hours) In order to help students better understand the concepts of continuous-time and discrete-time signals and systems, master the ability to analyze and solve problems related to linear time-invariant systems, and improve their practical skills, the following four typical experimental classes will be arranged: 1. Step and impulse response of RLC circuits. (2 contact hours; 2 self-study hours) 2. Simulation of continuous-time systems. (2 contact hours; 2 self-study hours) 3. Sampling theorem and signal reconstruction. (2 contact hours; 1 self-study hours) 4. Signal decomposition and synthesis.(2 contact hours; 1 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignments should be completed 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 experiments (20%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Zheng Junli. Signals and Systems [M]. Beijing: Higher Education Press, 2018. 2. **Reference books** [1] Wang Baoxiang. Signals and Systems (2nd Edition) [M]. Harbin:

	Harbin Institute of Technology Press, 2001. [2] Guan Zhizhong. Signals and Linear Systems [M]. Beijing: Higher Education Press, 2004. [3] Wu Dazheng. Signals and Linear Systems [M]. Beijing: Higher Education Press, 2005.
Data of last amendment	August 2023

Electromagnetic Fields and Waves

Module designation	Electromagnetic Fields and Waves
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Associate Professor Zhu Shuo
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Mechanical Design, Manufacturing 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: 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, Fundamentals of Circuit Analysis
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Understand the fundamental concepts involved in mathematics and natural sciences, master the basic processes and techniques of mathematical modeling, and be able to apply appropriate mathematical tools for analysis and problem-solving. 2. Possess the ability to integrate the fundamental theories and methods of mathematics, natural sciences, computing, and engineering sciences. ● **Skill:** 1. Have the ability to integrate foundational knowledge in the field of electronic information with mathematical logic, natural science principles, and advanced computational analysis methods. 2. Through theoretical derivation and practical analysis, strengthen logical thinking and innovative abilities, and be capable

	of independently conducting solution design, system modeling, performance evaluation, and optimization in the field of electronic information engineering. ● **Competence:** 1. Master specialized knowledge and advanced mathematical modeling techniques, and have the ability to analyze and precisely describe complex engineering problems. 2. Be able to flexibly use tools such as signal processing, circuit analysis, and system modeling to abstractly model, simulate, analyze, and optimize solutions for multivariable and nonlinear engineering problems, providing solid theoretical support and solutions for engineering design and innovation.
Content	**Part A. Theoretical teaching** (40 contact hours; 36 self-study hours) **Chapter 1 Vector Analysis** (6 contact hours; 6 self-study hours) ● Vector Operations ● Scalar Fields and Vector Fields ● Orthogonal Coordinate Systems and Differential Elements ● Directional Derivatives and Gradients of Scalar Fields ● Flux and Divergence of Vector Fields ● Circulation and Curl of Vector Fields ● Helmholtz Theorem **Chapter 2 Electrostatic Field** (10 contact hours; 8 self-study hours) ● Electric Field Intensity and Coulomb's Law ● Electrostatic Field Equations in Vacuum ● Electric Potential ● Electrostatic Field Equations in a Medium ● Boundary Conditions of Electrostatic Fields ● Poisson's Equation and Laplace's Equation ● Boundary Value Problems of Static Fields ● Separation of Variables Method ● Method of Images ● Multi-Conductor Systems and Partial Capacitance ● Electrostatic Field Energy and Electrostatic Force **Chapter 3 Constant Electric Field** (4 contact hours; 4 self-study hours) ● Current Density ● Fundamental Equations of Constant Electric Fields ● Boundary Conditions of Constant Electric Fields

	● Comparison between Constant Electric Fields and Electrostatic Fields **Chapter 4 Constant Magnetic Field** (8 contact hours; 8 self-study hours) ● Ampère's Force Law and Magnetic Induction Intensity ● Fundamental Equations of Constant Magnetic Fields in Vacuum ● Vector Magnetic Potential ● Equations of Constant Magnetic Fields in Magnetic Media ● Boundary Conditions of Constant Magnetic Fields ● Inductance ● Magnetic Field Energy and Magnetic Force **Chapter 5 Time-Varying Electromagnetic Fields** (10 contact hours; 8 self-study hours) ● Faraday's Law of Electromagnetic Induction ● Displacement Current ● Maxwell's Equations ● Boundary Conditions of Time-Varying Electromagnetic Fields ● Complex Representation of Sinusoidal Electromagnetic Fields ● Poynting's Theorem ● Dynamic Potential **Chapter 6 Plane Electromagnetic Waves** (10 contact hours; 10 self-study hours) ● Uniform Plane Waves in Ideal Media ● Polarization of Electromagnetic Waves ● Uniform Plane Waves in Conductive Media **Part B. Experiment teaching** (8 contact hours; 6 self-study hours) To help students better understand the concepts and principles of Electromagnetic Fields and Waves, an experimental system will be constructed using electronic information expertise. The experiments will be conducted safely and reliably to enhance students' practical skills. The following three typical laboratory sessions will be arranged: 1. Understanding Field Vectors Experiment. (2 contact hours; 2 self-study hours) 2. Radiation Principles of Electromagnetic Waves Experiment. (3 contact hours; 2 self-study hours) 3. Polarization of Electromagnetic Waves Experiment. (3 contact hours; 2 self-study hours)
Examination forms	Closed-book written exam
Study and	After-class assignment shall be done independently by students

examination requirements	after each class. No late arrivals, no early departures, and no unauthorized absences. Classroom learning discussion and post class feedback performance accounts for 40%. Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Shao Xiaotao. Electromagnetic Fields and Waves [M]. Beijing: Tsinghua University Press, 2022. 2. **Reference books** [1] Xie Fang. Electromagnetic Fields and Waves [M]. Beijing: Higher Education Press, 2019. [2] Yang Rugui. Electromagnetic Fields and Waves [M]. Beijing: Higher Education Press, 2019. [3] Jiao Qixiang. Electromagnetic Fields and Waves. Beijing: Science Press in 2020.
Data of last amendment	August 2024

Digital Signal Processing

Module designation	Digital Signal Processing
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Professor Gu Jing
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering 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: 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 I, Signals & Systems I
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Discrete-time signals and systems, z-transform and discrete-time Fourier transform, discrete Fourier transform (DFT) and its fast algorithm (FFT), digital filter design and other related knowledge. 2. The connection between the modules of signal analysis, system design, and algorithm implementation. 3. The application flow of digital signal processing techniques. ● **Skill:** 1. Be able to understand the concepts of signal processing, system analysis, and algorithm design. 2. Be able to apply z-transform and discrete-time Fourier transform to analyze signal processing problems, such as signal spectrum analysis and system frequency response. 3. Be able to design digital filters, master general signal processing

	methods, and verify the accuracy of the techniques through experiments. ● **Competence:** 1. Apply the basic principles of digital signal processing systems to analyze, design, and implement common signal processing algorithms. 2. Master the application process of digital signal processing techniques in information and communication engineering, analyze the functional roles of each link in digital signal processing systems, and the impact of each link on technical solutions. 3. Master the cutting-edge knowledge and skills in the field of digital signal processing, and be able to comprehensively evaluate technical solutions through theoretical knowledge and experiments.
Content	**Part A. Theoretical teaching** (40 contact hours; 32 self-study hours) **Chapter 1 Discrete-Time Signals and Systems** (4 contact hours; 4 self-study hours) ● Discrete-time signals — sequences. ● Linear shift-invariant systems. ● Constant-coefficient linear difference equations — input-output representation of discrete-time systems. ● Sampling of continuous-time signals. **Chapter 2 z-Transform and Discrete-Time Fourier Transform** (6 contact hours; 6 self-study hours) ● z-transform of sequences. ● Mapping from s-plane to z-plane. ● Discrete-time Fourier transform (DTFT) — Fourier transform of sequences. ● Frequency-domain representation of discrete-time LTI systems. **Chapter 3 Discrete Fourier Transform (DFT)** (6 contact hours; 6 self-study hours) ● Four possible forms of the Fourier transform. ● Fourier series of periodic sequences — discrete Fourier series (DFS). ● Discrete Fourier transform (DFT) — discrete frequency-domain representation of finite-length sequences. ● Properties of DFT. ● Frequency-domain sampling theory. ● Applications of DFT; relationship between X(z), X(ejω), and

	X(k) of finite-length sequences. **Chapter 4 Fast Fourier Transform (FFT)** (4 contact hours; 4 self-study hours) ● Computational complexity of direct DFT calculation, ways to reduce computational complexity. ● Radix-2 FFT algorithm based on decimation-in-time (DIT). ● Radix-2 FFT algorithm based on decimation-in-frequency (DIF). ● Comparison between DIT-FFT and DIF-FFT. ● Fast algorithm for inverse DFT (IFFT). ● Flowchart of radix-2 FFT algorithm. ● Linear convolution using FFT algorithm. **Chapter 5 Basic Structures of Digital Filters** (4 contact hours; 4 self-study hours) ● Overview. ● Basic structures of infinite impulse response (IIR) filters. ● Basic structures of finite impulse response (FIR) filters. **Chapter 6 Basic Concepts of Digital Filters and Several Special Filters** (2 contact hours; 2 self-study hours) ● Basic concepts of digital filters. ● All-pass filters. ● Minimum phase-lag filters. ● Notch filters. ● Digital resonators. ● Comb filters. ● Waveform generators. **Chapter 7 Design Methods of Infinite Impulse Response (IIR) Digital Filters** (6 contact hours; 6 self-study hours) ● Overview. ● Implementation steps of digital filters. ● Technical specifications of digital filters. ● Classification of IIR digital filter design methods. ● Design of analog prototype low-pass filters. ● Frequency transformation in the analog domain. ● Indirect design methods for IIR digital filters. ● Mapping methods from analog filters to digital filters. ● First design method for digital filters. ● Direct transformation of analog low-pass filters into four types of passband digital filters.

	Chapter 8 Design Methods of Finite Impulse Response (FIR) Digital Filters (6 contact hours; 6 self-study hours) ● Overview. ● Characteristics of linear phase FIR digital filters. ● Window function design method. ● Frequency sampling design method. ● Optimal design methods for linear phase FIR filters. **Part B. Experiment teaching** (8 contact hours; 8 self-study hours) In order to help students better understand the concepts and principles of digital signal processing, master the processes of signal analysis, system design, and algorithm implementation, and improve their practical skills, the following three typical experimental classes will be arranged: 1. Typical discrete signals and their MATLAB implementation. (2 contact hours; 2 self-study hours) 2. Discrete-time signals and systems. (2 contact hours; 2 self-study hours) 3. z-transform and inverse z-transform. (2 contact hours; 2 self-study hours) 4. Discrete Fourier transform (DFT) and its fast algorithm (FFT). (2 contact hours; 2 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 40%, including assignments (20%) and experiments (20%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Cheng Peiqing. Digital Signal Processing Tutorial (MATLAB Edition) [M]. Beijing: Tsinghua University Press, 2020. **2. Reference books** [1] Wang Jun, Wang Zulin. Digital Signal Processing [M]. Beijing: Higher Education Press, 2019. [2] Liu Xingzhao. Digital Signal Processing [M]. Beijing: Electronic Industry Press, 2010. [3] Chen Houjin, Xue Jian. Digital Signal Processing (3rd Edition) [M]. Beijing: Higher Education Press, 2018.

Data of last amendment	August 2024

High Frequency Electronic Circuit

Module designation	High Frequency Electronic Circuit
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Wang Fei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering 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: 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	Fundamentals of Analog Electronic Technology, Microcomputer Principles and Single-Chip Microcomputer Technology, Electronic Design Automation
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Basic concepts, principles, and applications of high-frequency electronic circuits and nonlinear electronic technology. 2. Circuit composition, functions, working principles, and analysis methods of basic high-frequency circuits in communication systems. 3. Calculation methods of high-frequency circuit performance, including unloaded and loaded quality factors, bandwidth, resonant frequency, etc. ● **Skill:** 1. Be able to analyze circuits using non-linear analysis methods such as piecewise linear method and Fourier decomposition. 2. Be able to design and analyze high-frequency small signal amplifiers, high-frequency power amplifiers, high-frequency oscillators, and linear/non-linear spectrum translation circuits.

	3. Be able to calculate the performance of high-frequency circuits, including unloaded and loaded quality factors, bandwidth, resonant frequency, etc. ● **Competence:** 1. Apply the basic principles of high-frequency electronic circuits to design, analyze, and calculate common high-frequency circuits. 2. Master the application process of high-frequency electronic circuits in information and communication engineering, analyze the functional roles of each link in high-frequency electronic circuits, and the impact of each link on technical solutions. 3. Master the cutting-edge knowledge and skills in the field of high-frequency electronic circuits, and be able to comprehensively evaluate technical solutions through theoretical knowledge and experiments.
Content	**Part A. Theoretical teaching** (40 contact hours; 34 self-study hours) **Chapter 1 Introduction** (1 contact hours; 1 self-study hours) ● Overview of High-Frequency Electronic Circuits. ● Linear and Nonlinear Circuits. ● Modern Communication Systems. ● Learning Content, Methods, and Requirements for High-Frequency Electronic Circuits. **Chapter 2 LC Resonant Circuits and Their Functions** (6 contact hours; 6 self-study hours) ● Main Research Content of LC Selective Frequency Networks. ● Series and Parallel Resonant Circuits. ● Impedance Transformation Networks. ● Selective Frequency Matching Networks. **Chapter 3 High-Frequency Small Signal Tuned Amplifiers** (6 contact hours; 4 self-study hours) ● Basic Concepts and Performance Indicators of High-Frequency Small Signal Amplifiers. ● Transistor Equivalent Model Analysis. ● Resonant Amplifier Circuits. ● Cascade of Resonant Amplifiers: Three-stage cascade. ● Other Types of Small Signal Tuned Amplifiers. **Chapter 4 High-Frequency Resonant Power Amplifier Circuits** (4 contact hours; 4 self-study hours) ● Basic Concepts and Performance Indicators of High-Frequency Resonant Power Amplifier Circuits.

	● Class C Resonant Power Amplifier Circuits. ● Dynamic Performance Analysis of High-Frequency Power Amplifier Circuits. ● DC Feed Circuits and Matching Networks. ● Integrated High-Power Amplifier Circuits. **Chapter 5 High-Frequency Sinusoidal Oscillators** (4 contact hours; 4 self-study hours) ● Basic Concepts and Performance Indicators of Oscillators. ● Basic Principles and Analysis Methods of Feedback Oscillators. ● Analysis Methods for LC Sinusoidal Oscillators. ● Other Types of Crystal Oscillators. **Chapter 6 Frequency Conversion Methods and Circuit Analysis** (5 contact hours; 5 self-study hours) ● Analysis Methods for Frequency Conversion Circuits. ● Three Types of Frequency Conversion Circuits. ● Main Devices for Frequency Conversion Circuits. **Chapter 7 Amplitude Modulation, Detection, and Mixing** (9 contact hours; 5 self-study hours) ● Basic Concepts and Performance Indicators of Amplitude Modulation. ● Detection Process and Calculation Methods. ● Mixing Process: Analysis of signal transmission process. **Chapter 8 Feedback Control Circuits** (5 contact hours; 5 self-study hours) ● Basic Concepts and Performance Indicators of Feedback Control Circuits. ● Three Types of Control Circuits. **Part B. Experiment teaching** (8 contact hours; 8 self-study hours) In order to help students better understand the concepts and principles of high-frequency electronic circuits, master the processes of circuit analysis and design, and improve their practical skills, the following experimental classes will be arranged: 1. Experiment on High-Frequency Small Signal Tuned Amplifiers. (2 contact hours; 2 self-study hours) 2. Experiment on Nonlinear Class C Power Amplifiers. (1 contact hours; 1 self-study hours) 3. Experiment on Three-Point Sinusoidal Oscillators. (1 contact hours; 1 self-study hours) 4. Experiment on Amplitude Modulation Using Analog Multipliers. (2 contact hours; 2 self-study hours)

	5. Experiment on Envelope Detection and Synchronous Detection. (2 contact hours; 2 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 40%, including experiments (24%) and assignments (16%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Xing Hongyan. High Frequency Electronic Circuit [M]. Beijing: Electronic Industry Press, 2021. 2. **Reference books** [1] Gao Jixiang, et al. High Frequency Electronic Circuit [M]. Beijing: Electronic Industry Press, 2016.
Data of last amendment	August 2024

Engineering Cartography

Module designation	Engineering Cartography
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Hu Changyu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 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. Theory of projection method 2. The relevant provisions on drawing in national standards. 3. Commands and operations of AutoCAD drawing software. ● **Skill:** 1. Be able to use the basic theory of projection method to draw drawings. 2. Be able to analyse various dimensions of part drawings, assembly drawings and other patterns and make correct annotations. 3. Be able to use AutoCAD drawing software to draw frames, basic shapes, three - views, etc. ● **Competence:** 1. Correctly understand and express design intentions, and accurately draw three - views, sectional views, axonometric drawings, etc.

	2. Strictly implement the relevant provisions on drawing in national standards during drawing.
Content	**Part A. Theoretical teaching** (24 contact hours; 20 self-study hours) **Chapter 1 Basic Knowledge of Drawing** (4 contact hours; 4 self-study hours) ● Drawing Tools and Their Use ● Some Provisions in National Standards "Technical Drawing" and "Mechanical Drawing" ● Geometric Construction ● Dimension Analysis and Drawing Steps of Plane Figures. **Chapter 2 Fundamentals of Orthographic Projection** (4 contact hours; 4 self-study hours) ● Basic Knowledge of Projection Method ● Projection of Points ● Projection of Lines ● Projection of Planes. **Chapter 3 Basic Solids and Intersection Lines of Solid Surfaces** (6 contact hours; 4 self-study hours) ● Projection of Planar Solids ● Projection of Revolved Solids ● Intersection of Planes and Planar Solids ● Intersection of Planes and Revolved Solids ● Intersection of Revolved Surface. **Chapter 4 Composite Solids** (6 contact hours; 4 self-study hours) ● Composition Analysis of Composite Solids ● Drawing Methods of Composite Solid Views ● Dimensioning of Composite Solids ● Methods of Reading Composite Solid Views ● Axonometric Drawings. **Chapter 5 Axonometric Drawings** (4 contact hours; 4 self-study hours) ● Basic Knowledge of Axonometric Drawings and Axonometric Projection Properties ● Isometric Projection ● Dimetric Projection ● Expression Methods of Machine Parts. **Part B. Experiment teaching** (8 contact hours; 8 self-study hours) The following four typical experimental classes will be arranged: 1. AutoCAD Basics and Solid Drawing Commands. (2 contact hours;

	2 self-study hours) 2. Common Modification Commands and Layer Control. (2 contact hours; 2 self-study hours) 3. Dimensioning and Blocks. (2 contact hours; 2 self-study hours) 4. Drawing Isometric Projections. (2 contact hours; 2 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 40%, including in-class performance (15%), assignments (10%) and experiment (15%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Zhu Juxiang. Modern Engineering Drawing [M]. Beijing: China Machine Press, 2023. 2. **Reference books** [1] National Bureau of Quality and Technical Supervision. GB/T 4457.4—2002. Mechanical Drawing – General Principles of Presentation[S]. Beijing: China Standards Press, 2014. [2] Yao Ji. Engineering Drawing and Computer Graphics [M]. Chongqing: Chongqing University Press, 2016. [3] He Jianying. Descriptive Geometry and Mechanical Drawing [M]. Beijing: Higher Education Press, 2016. [4] Chen Jiefeng. Mechanical Drawing [M]. Chongqing: Chongqing University Press, 2017.
Data of last amendment	August 2024

C Language Programming

Module designation	C Language Programming
Semester(s) in which the module is taught	1st Semester
Person responsible for the module	Lecturer Hao Wu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of IoT Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 64 hours Including: Theoretical teaching: 48 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 60-80 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	None
Module objectives/intendedlearning outcomes	● **Knowledge** 1. Master the essential fundamental knowledge and techniques of C programming. 2. Understand basic programming standards and conventions. 3. rasp the basic concepts of program design and the logical steps of problem solving from a computational perspective. ● **Skills** 1. Acquire the ability to conduct requirement analysis, algorithm design, program coding, debugging, and testing for specific problems. 2. Master the configuration of C programming development environments. 3. Proficiently use development environments and integrated development tools to efficiently develop and test C programs. ● **Competence** 1. Apply C programming knowledge to solve practical problems.

	2. Provide concrete solutions through systematic development processes. 3. Possess the capability to utilize modern programming tools for efficient software development.
Content	**Part A. Theoretical teaching** (48 contact hours; 47 self-study hours) **Chapter 1: Overview(**5 contact hours; 4 self-study hours) ● Origin, development, and features of the C language ● C program development process and environment ● Methods of learning programming ● Introduction to algorithms **Chapter 2: Data Types, Operators, and Expressions**(5 contact hours; 5 self-study hours) ● Basic character set, keywords, identifiers, constants, and variables ● Data types, operators, and expressions **Chapter 3: Sequential Programming**(5contact hours; 5 self-study hours) ● Data input/output using printf() and scanf() ● Formatted input and output ● Function writing conventions **Chapter 4: Branching Structure Programming**(5 contact hours; 5 self-study hours) ● Structure of the if statement ● Nested if statements ● switch statement **Chapter 5: Loop Programming**(5 contact hours; 5 self-study hours) ● Loop structures and nesting ● Use of break and continue ● for loops and nesting **Chapter 6: Arrays**(5 contact hours; 5 self-study hours) ● One-dimensional arrays and applications ● Two-dimensional arrays and applications ● Character arrays and applications ● Multidimensional arrays **Chapter 7: Functions**(5 contact hours; 5 self-study hours) ● Function declaration and definition ● Function parameters and return values

	● Local and global variables ● Variable storage classes ● Function calls and recursion **Chapter 8: Pointers**(5 contact hours; 5 self-study hours) ● Pointers and pointer variables ● Definition and referencing of pointers ● Pointer operators and expressions ● Pointers and arrays ● Pointer-to-pointer ● Pointers with two-dimensional arrays ● Pointers and functions **Chapter 9: Structures and Enumerations**(5 contact hours; 5 self-study hours) ● Structure declaration and variable definition ● Structure arrays and pointers ● Structures with functions ● Enumerations and user-defined types ● Unions ● Linked lists and applications **Chapter 10: Files**(3 contact hours; 3 self-study hours) ● Concepts of files and streams ● File operations **Part B. Laboratory Teaching (16 contact hours;9 self-study hours)** To help students better understand the Industrial Internet of Things and virtual simulation, and to enhance their practical skills, the following four typical laboratory classes are arranged:C Language Environment and Simple Program Design 1. Data Types(2 contact hours; 1 self-study hours) 2. Data Operations and Sequential Programming(2 contact hours; 1 self-study hours) 3. Branching Structure Programming(2 contact hours; 1 self-study hours) 4. Loop Structure Programming(2 contact hours; 1 self-study hours) 5. Application of Arrays(2 contact hours; 1 self-study hours) 6. Application of Functions(2 contact hours; 1 self-study hours) 7. Application of Pointers(2 contact hours; 1 self-study hours) 8. Structures and Applications(1 contact hours; 1 self-study hours)

	9. Files and Applications(1 contact hours; 1 self-study hours)
Examination forms	Closed-book written examination.
Study and examination requirements	Homework must be completed independently by students after each class. No lateness, early leave, or unexcused absences are allowed. Formative assessment accounts for 40%, including homework (20%) and laboratory work (20%). Final assessment accounts for 60%.
Reading list	**1. Required books** [1]Yan Li, Zhenhong Zhu, Huantong Geng. C Language Programming. Jiangsu University Press, September 2020. [2]Qinming He, Hui Yan. C Language Programming (4th Edition). Higher Education Press, September 2020. [3]Haoqiang Tan. C Programming (5th Edition). Tsinghua University Press, July 2017. [4] Brian W. Kernighan, Dennis M. Ritchie. The C Programming Language. China Machine Press, March 2019.
Data of last amendment	August 2024

Electronic Design Automation

Module designation	Electronic Design Automation
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Lecturer Yu Wei
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 16 hours Experiment teaching: 16 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	Fundamentals of Digital Electronic Technology, Fundamentals of Circuit Analysis
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Understand the basic concepts and application areas of EDA technology, master the operation skills of EDA software, and understand the important role of EDA in circuit design and manufacturing. ● **Course Objective 2:** Understand the basic process of schematic design and PCB design, master the operation and application of AD software, and understand its important role in circuit design. ● **Course Objective 3:** Understand its functions and characteristics as an EDA tool, master its interface operation and simulation analysis methods, and understand its application value in circuit design.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study hours)

	Chapter 1 Overview of EDA Technology (2 contact hours; 2 self-study hours) ● Introduction to the current state of development and applications of EDA technology. ● Introduction to circuit simulation software. ● Introduction to PCB basics. **Chapter 2 Schematic Design, PCB Design and AD Software** (6 contact hours; 6 self-study hours) ● Introduction to schematic design. ● Introduction to PCB design flow and foundation. ● Introduction to PCB design rules of altium design software. **Chapter 3 Introduction to NI Multisim** (8 contact hours; 6 self-study hours) ● Introduction to the history of NI Multisim. ● Introduction to NI Multisim user interface. ● Introduction to NI Multisim schematics. ● Introduction to NI Multisim circuit simulation. **Part B. Experimental teaching** (16 contact hours; 14 self-study hours) In order to help students better understand the concept and principle of electronic design automation, and improve their practical skills, the following four typical experimental classes will be arranged: 1. Software awareness experiment. (4 contact hours; 3 self-study hours) 2. Circuit design and simulation experiment 1. (4 contact hours; 3 self-study hours) 3. Circuit design and simulation experiment 2. (4 contact hours; 4 self-study hours) 4. Circuit design and simulation experiment 3. (4 contact hours; 4 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 30%, including assignments (10%) and experiment (20%). Final assessment (closed-book written exam) accounts for 70%.
Reading list	**1. Required books**

	[1] Zhao Quanli. Multisim Circuit Design and Simulation - Based on the Multisim 14.0 Platform [M]. Beijing: Machinery Industry Press, 2022. 2. **Reference books** [1] Huang Zhiwei. Computer Simulation Design and Analysis of Electronic Circuits Based on NI Multisim [M]. Beijing: Electronic Industry Press, 2017. [2] Pan Yongxiong. Electronic Circuit CAD Practical Tutorial - Based on Protel 99 SE Platform [M]. Xi'an: Xidian University Press, 2016. [3] Cui Yansong, Huang Jianming, Zhao Tonggang. Circuit Simulation and PCB Design [M]. Beijing: Tsinghua University Press, 2019.
Data of last amendment	August 2024

Microcomputer Principles and Single-Chip Microcomputer Technology

Module designation	Microcomputer Principles and Single-Chip Microcomputer Technology
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Lecturer Zuo Guanfang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 48 hours Including: Theoretical teaching: 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	Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology, C Language Programming
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Basic concepts of microcomputer principles and fundamental knowledge of microcontrollers. 2. Applications of various architectural circuits and languages. 3. C51 programming methods and techniques, memory composition and interface expansion methods, interrupt structures and their applications. ● **Skill:** 1. Be able to establish corresponding hardware and software circuit solutions for specific engineering problems using typical circuits. 2. Be able to verify feasibility through analytical calculations or experimental methods. ● **Competence:** 1. Preliminary capability to design and implement microcomputer principles and microcontroller systems.

	2. Establish corresponding hardware and software circuit solutions based on specific engineering problems.
Content	**Part A. Theoretical teaching** (48 contact hours; 42 self-study hours) **Chapter 1 Introduction to Microprocessor Technology** (4 contact hours; 4 self-study hours) ● Internal structure, working principles, clock, development history, characteristics, classification, and applications of microprocessors. ● Basic concepts of microcontrollers: classification of microcontrollers, MCS-51 series microcontrollers, Atmel's 51 series microcontrollers, STC-51 microcontrollers, product labeling and pin information of microcontrollers, and applications of microcontrollers. ● Development process of microprocessor control systems and development tools such as Keil C51, Proteus, microcontroller development simulators, and programmers. **Chapter 2 The 8086 Microprocessor and Its Architecture** (6 contact hours; 5 self-study hours) ● General performance characteristics of the 8086 microprocessor, its internal programming structure, and memory organization. ● Operating modes of the 8086, its external structure, pin signals, and their functions. ● Basic concepts of timing and analysis of typical timing sequences. ● Addressing modes and internal registers. **Chapter 3 Basic Structure of the MCS-51 Series Microcontrollers** (6 contact hours; 5 self-study hours) ● Pin functions of the MCS-51 microcontroller. ● Hardware structure of the MCS-51 microcontroller: Central Processing Unit (CPU), memory structure, input/output ports, clock circuit and CPU timing, reset circuit. ● Minimum system of the microcontroller. **Chapter 4 C51 Programming for Microcontrollers** (6 contact hours; 5 self-study hours) ● Introduction to C51 language, comparison between C51 and standard C. ● Basics of C51 language: identifiers, keywords, data types, data storage types, variable definitions, local and global variables, preprocessor directives.

	● Expressions in C51, branch control statements, loop control statements, and jump statements in C51. ● User-defined functions and interrupt service functions in C51. **Chapter 5 Human-Machine Interface Design for Microprocessor Control Systems** (6 contact hours; 5 self-study hours) ● Keyboard interface design: principles of key switches, independent key interfaces, and matrix key interfaces. ● LED digital tube interface design: structure and working principles of LED digital tube displays, interface between LED digital tubes and microcontrollers, and programming. ● LCD interface design: appearance and pin functions of character LCD modules, structure, operation commands, and programming. ● Buzzer interface design. **Chapter 6 Interrupts and Timer/Counter Application Design in Microprocessors** (8 contact hours; 7 self-study hours) ● Basic concepts of interrupts and interrupt systems. ● Structure of the MCS-51 interrupt system, interrupt sources, interrupt registers, interrupt response and handling, design and application of interrupt service routines. ● Structure and working principles of the MCS-51 microcontroller timers/counters, methods for implementing timing, control registers and operating modes of timers/counters, and applications of timers/counters. **Chapter 7 Communication Design for Microprocessor Control Systems** (8 contact hours; 7 self-study hours) ● Basics of serial communication: parallel communication vs. serial communication, classification of serial communication, baud rate, and common interface circuit standards for serial communication. ● Structure of the MCS-51 microcontroller serial port. ● Operating modes of the MCS-51 microcontroller serial port. ● Setting the baud rate for MCS-51 serial communication. ● Serial port design for the MCS-51 series microcontrollers. **Chapter 8 Interface Expansion for Processor Control Systems** (4 contact hours; 4 self-study hours) ● External parallel bus of the 51 microcontrollers: parallel bus structure, addressing techniques.

	● A/D and D/A converters.
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 regular assignments (30%) and major assignments (10%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Li Jinghua. Principles of Microcomputers and Microcontroller Technology (2nd Edition) [M]. Beijing: Electronic Industry Press, 2023. 2. **Reference books** [1] Chen Yifei. Principles of Microcomputers and Interface Technology (3rd Edition) [M]. Beijing: Electronic Industry Press, 2023. [2] Song Zhiqiang. Principles and Applications of Microcontrollers: A Task-Driven Tutorial Based on C51 and Proteus [M]. Beijing: Mechanical Industry Press, 2022. [3] Zhang Yigang. Principles and Applications of Microcontrollers: C51 Programming and Proteus Simulation (3rd Edition) [M]. Beijing: Higher Education Press, 2021.
Data of last amendment	August 2024

Experiments for Microcomputer Principles and Single-Chip Microcomputer

Module designation	Experiments for Microcomputer Principles and Single-Chip Microcomputer
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Lecturer Zuo Guanfang
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Experiment teaching: 16 hours Size of class: 40 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology, C Language Programming
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Basic knowledge of simulation software, hardware experimental platforms, and program development tools. 2. C51 programming methods and techniques, memory composition and interface expansion methods, interrupt structures and their applications. ● **Skill:** 1. Be able to use simulation software such as Proteus or hardware experimental platforms, and program development tools like Keil. 2. Be able to utilize microcomputer interface technology to formulate appropriate experimental plans, construct (simulate) experimental systems, and conduct experimental research. ● **Competence:** 1. Analyse typical microprocessor application systems and design hardware and software for simple control systems. 2. Extract and analyse technical issues in microprocessor

	application systems, and accurately express design ideas through technical reports or oral presentations. 3. Analyse and solve technical problems in microprocessor application systems, and articulate design ideas effectively through technical reports or oral presentations.
Content	**Part A. Experiment teaching** (16 contact hours; 44 self-study hours) The following 6 typical experimental classes and a assessment will be arranged: 1. System Familiarization Experiment. (2 contact hours; 6 self-study hours) 2. Running Light Experiment. (2 contact hours; 6 self-study hours) 3. Static Digital Tube Application Experiment. (2 contact hours; 6 self-study hours) 4. Timer Interrupt Control Experiment. (2 contact hours; 6 self-study hours) 5. RS-232 Serial Communication Experiment. (2 contact hours; 6 self-study hours) 6. ADC0809 Parallel A/D Conversion Experiment. (2 contact hours; 6 self-study hours) 7. Practical Assessment. (2 contact hours; 8 self-study hours)
Examination forms	Practical Assessment
Study and examination requirements	Experiment reports 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 experiment reports (40%). Final assessment (Practical Assessment) accounts for 60%.
Reading list	**1. Required books** [1] Guo Yecai. Laboratory Tutorial on Principles of Microcomputers and Microcontroller Technology [M]. Zhenjiang: Jiangsu University Press, 2020. **2. Reference books** [1] Li Jinghua. Principles of Microcomputers and Microcontroller Technology (2nd Edition) [M]. Beijing: Electronic Industry Press, 2023.
Data of last amendment	August 2024

Information Theory and Coding

Module designation	Information Theory and Coding
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Cao Yue
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 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	Probability Theory and Statistics
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. The fundamental principles of information theory and their application in engineering practice. 2. The basic theories and methods of abstracting and analysing mathematical models 3. The basic principles and methods of coding. ● **Skill:** 1. Be able to abstract real-world problems into mathematical models, analyse them, and establish solutions based on practical requirements. 2. Be able to design and evaluate systems or units (components) for information acquisition, transmission, processing, and application, selecting optimal solutions. 3. Be able to rationally analyse and combine multiple mathematical models to address complex real-world problems, making reasonable model selections. ● **Competence:**

	1. Apply theoretical knowledge to solve complex engineering problems and guide engineering practice. 2. Conduct research on complex engineering problems in electronic information engineering using scientific principles and methods. 3. Synthesize information and draw reasonable, effective conclusions to address practical challenges.
Content	**Part A. Theoretical teaching** (32 contact hours; 28 self-study hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) ● Concepts, properties, and classification of information. ● Communication system models and the development of information theory. ● Research areas of information theory and the evolution of coding technologies. **Chapter 2 Source Entropy** (6 contact hours; 6 self-study hours) ● Mathematical models of information sources, self-information of source symbols, conditional self-information, joint self-information, mutual information, and their properties. ● Source entropy and its main properties, joint entropy, conditional entropy, the definition and properties of average mutual information, and the relationships among various entropies. ● Characteristics of Markov sources and the calculation of their limit entropy, redundancy, the meaning of information variation, the concept of entropy for continuous sources, the maximum continuous entropy theorem, and the discrete lossless source coding theorem. **Chapter 3 Channel Capacity** (4 contact hours; 4 self-study hours) ● The meaning of channel capacity and the calculation formulas for channel capacity of several special channels. ● Channel capacity of continuous channels and the Shannon formula. ● Channel coding theorem. **Chapter 4 Rate-Distortion Function** (4 contact hours; 4 self-study hours) ● The meaning and properties of distortion functions. ● Source coding theorem under the fidelity criterion.

	Chapter 5 Source Coding (8 contact hours; 6 self-study hours) ● The role and implementation methods of source coding. ● Shannon coding and Huffman coding. **Chapter 6 Channel Coding** (8 contact hours; 6 self-study hours) ● The role and classification of channel coding, burst errors and random errors, parity check codes. ● Repetition message bit coding, Hamming distance, and error detection/correction capabilities. ● Minimum error probability decoding criterion, maximum likelihood decoding criterion, minimum distance decoding criterion, principles of channel coding, anti-interference channel coding theorem, error-correcting codes, and their error correction capabilities. ● Linear block codes, definition and description of Hamming codes, generator matrix and encoding circuits of cyclic codes.
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 in-class performance (10) and assignments (30%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Cao Xuehong. Information Theory and Coding (3rd Edition) [M]. Beijing: Tsinghua University Press, 2016. **2. Reference books** [1] Fu Zuyun. Information Theory and Coding (2nd Edition) [M]. Beijing: Publishing House of Electronics Industry, 2021.
Data of last amendment	August 2024

Modern Sensor Technology

Module designation	Modern Sensor Technology
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer Zhang Jian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment 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	Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Master the basic knowledge of measurement and familiarize with the structure, principle, characteristics and application of various commonly used sensors. ● **Course Objective 2:** Knowledge of measurement circuits commonly used in engineering inspection and their operating principles, and the ability to design simple sensor measurement circuits. ● **Course Objective 3:** Familiarize with static and dynamic characteristics of transducers and their calibration methods, and be able to select suitable transducers according to the experimental program. ● **Course Objective 4:** Ability to perform preliminary detection system design based on learned sensor characteristics.

Content	**Part A. Theoretical teaching** (24 contact hours; 21 self-study hours) **Chapter 1 Basics of Sensors and Measurements** (2 contact hours; 2 self-study hours) ● Basic concepts of sensors, definition, content and characteristics of measurement. ● Methods of electronic measurement, principles of electronic measurement instruments and development of electronic measurement techniques and instruments. **Chapter 2 Resistive Sensors and Their Applications** (4 contact hours; 3 self-study hours) ● Definition, categories, working principle and uses of potentiometer type sensors, no load and load characteristics of linear potentiometers. ● Structure and classification of strain gauges, working principle of resistance strain gauges. ● The main reasons for the temperature error of resistance strain gauges and the method of line compensation. ● Types of strain measuring bridge circuits, operating characteristics of bridges. **Chapter 3 Inductive Sensors and Their Applications** (4 contact hours; 3 self-study hours) ● Structure, principle of operation, measurable and measuring range versus sensitivity and linearity of single coil inductive sensors and differential inductive sensors. ● Principle of operation of measurement circuits of inductive sensors. ● Types of differential transformer-type sensor structures, principles of operation, output characteristics, and the relationship between sensitivity and the size of the air gap at the initial equilibrium position. **Chapter 4 Capacitive Sensors and Their Applications** (4 contact hours; 3 self-study hours) ● Principle of operation of three types of capacitive sensors: variable gap, variable area and variable dielectric constant, the conflicting relationship between sensitivity and nonlinear error and its solution. ● Advantages and disadvantages of capacitive sensors, the influence of distributed capacitance on their applications. **Chapter 5 Photoelectric Sensors and Their Applications** (4 contact hours; 4 self-study hours)

	● Light sources, optoelectronic devices, image sensors and position sensitive devices, fiber optic sensors, grating sensors, laser sensors. **Chapter 6 Piezoelectric Sensors and Their Applications** (3 contact hours; 3 self-study hours) ● Piezoelectric effect and piezoelectric elements. ● Equivalent and measurement circuits. ● Examples of Piezoelectric Sensors. **Chapter 7 Thermoelectric Sensors and Their Applications** (3 contact hours; 3 self-study hours) ● Thermocouple sensors. ● RTD sensors. ● Thermistor sensors. **Part B. Experimental teaching** (8 contact hours; 7 self-study hours) In order to help students better understand the concept and principle of modern sensor technology, and improve their practical skills, the following five typical experimental classes will be arranged: 1. Infrared directional switch experiment(1). (4 contact hours; 3 self-study hours) 2. Infrared directional switch experiment(2). (4 contact hours; 4 self-study hours)
Examination forms	Report
Study and examination requirements	No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%. Report accounts for 60%.
Reading list	**1. Required books** [1] Tang Wenyan. Sensors [M]. Beijing: Machinery Industry Press, 2020. 2. **Reference books** [1] Song Aiguo. Sensor Technology [M]. Nanjing: Southeast University Press, 2021.
Data of last amendment	August 2024

Principles of Communication II

Module designation	Principles of Communication II
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Liu Yu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 40 hours Including: Theoretical teaching: 32 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 75 hours Contact hours = 40 hours Self-study hours = 35 hours
Credit points	2.5
Required and recommended prerequisites for joining the module	Advanced Mathematics I(1), Advanced Mathematics I(2), Linear Algebra, Probability Theory and Statistics, Fundamentals of Circuit Analysis, Fundamentals of Analog Electronic Technology, Signals & Systems I
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Master the basic knowledge of analog communication systems, digital communication systems (baseband/frequency band), study the process of mathematical modeling, understand the mechanism of mathematical analysis and derivation, correlate and compare related knowledge points, master important theorems: Shannon's Theorem, Nyquist Criterion, Sampling Theorem, etc., and understand the process of their derivation, to provide a theoretical analysis basis for guiding engineering applications. ● **Course Objective 2:** Based on the basic professional knowledge of communication systems, design the core or key processing modules in a communication system, including its modeling, calculation, simulation, and analysis of the results or data to guide engineering design and implementation.

	• **Course Objective 3:** Understand the channel model of communication systems, familiar with the basic principles and implementation methods of digital transmission of analog signals, and understand the new digital bandpass modulation techniques and the basic principles of error coding.
Content	**Part A. Theoretical teaching** (32 contact hours; 28 self-study hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) • Describe the definition, purpose, evolution, and importance of communication. • Introduce the definitions and relationships of information, messages, and signals, as well as measures of information quantity. • Introduce the basic components of a communication system, including sources, channels, and hosts. • Understand communication methods such as simplex, half-duplex, and full-duplex as well as serial and parallel transmission. **Chapter 2 Stochastic Process** (4 contact hours; 4 self-study hours) • Introduce the basic concepts of stochastic processes, including the properties of stochastic processes over time, the relationship with random variables, and the sample function of stochastic processes. • Describe the mathematical characteristics of stochastic processes, including mathematical expectation (mean), variance, covariance, etc. • Introduce smooth stochastic processes, including the definitions and properties of strictly smooth stochastic processes and wide smooth stochastic processes. • An introduction to the numerical characteristics of stochastic processes, including autocorrelation function, power spectral density, etc. • An introduction to Gaussian stochastic processes, including the properties, importance and applications of Gaussian stochastic processes in communications. **Chapter 3 Signal Path** (6 contact hours; 4 self-study hours) • Introduce the definition and classification of channels.

	• Introduce mathematical models of channels, including modulated channel models and coded channel models, and their effect on signal transmission. • Explain the effects of channel characteristics on signal transmission, including distortion-free transmission, distortion, frequency distortion, and phase distortion. • An explanation of noise in the channel, including the definition and classification of noise and its effect on signal transmission. • Introduce the concept of channel capacity, including discrete channel capacity and continuous channel capacity. **Chapter 4 Continuous Wave Modulation** (6 contact hours; 4 self-study hours) • Introduce the overview of continuous wave modulation system, including the basic concepts, classification and application scenarios of continuous wave modulation system. • An introduction to linear modulation systems, including mathematical modeling, signal analysis, demodulation and performance analysis of linear modulation systems. • Introduce linear modulation methods including AM (ordinary amplitude modulation), DSB (double-sideband amplitude modulation), SSB (single-sideband amplitude modulation) and VSB (residual sideband amplitude modulation). • Explain nonlinear modulation. • Introduction to continuous wave modulation of digital signals including binary amplitude shift keying (2ASK), binary frequency shift keying (2FSK), binary phase shift keying (2PSK), and other continuous wave modulation methods for digital signals. **Chapter 5 Pulse Modulation** (4 contact hours; 4 self-study hours) • Introduce the basic concepts of pulse modulation. • To explain the main types of pulse modulation and their working principles and characteristics. • Introduce the components of a pulse modulator. • Explaining the applications of pulse modulation and analyzing examples of pulse modulation applications in audio, video, and data transmission to demonstrate its importance in practical communication systems. **Chapter 6 Digital Baseband System** (6 contact hours; 6 self-study hours)

	● Introduction to digital baseband signals and their spectral characteristics. ● Explain the common code types of baseband transmission. ● Introduce digital baseband signal transmission and inter-code crosstalk, analyze the causes, effects and solutions of inter-code crosstalk. ● To explain the characteristics of baseband transmission without inter-code crosstalk. ● Introduce the noise immunity of baseband transmission system; explain the eye diagram and time domain equalization. **Chapter 7 Digital Bandpass System** (4 contact hours; 4 self-study hours) ● Introduces an overview of digital bandpass transmission systems. ● Explain digital modulation techniques, including basic digital modulation methods such as amplitude keying (ASK), frequency shift keying (FSK), and phase shift keying (PSK). ● Introduce digital demodulation techniques. ● Analyze the key indicators such as noise immunity, band utilization, power utilization, etc. of digital bandpass transmission systems and make performance comparisons. ● Introduction to multi-degree digital modulation systems. **Part B. Experimental teaching** (8 contact hours; 7 self-study hours) In order to help students better understand the concept and principle of communication, and improve their practical skills, the following five typical experimental classes will be arranged: 1. AMI/HDB3 compiled code. (2 contact hours; 1 self-study hours) 2. Pulse code modulation (PCM). (2 contact hours; 2 self-study hours) 3. FSK modulation and demodulation. (2 contact hours; 2 self-study hours) 4. Comprehensive experiments on communication systems. (2 contact hours; 2 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%, including assignments and

	experiment (20%) and mid-term exam (20%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Fan Changxin, Cao Lina. Communications Principle [M]. Beijing: Defense Industry Press, 2018. 2. **Reference books** [1] Li Xiaofeng, Zhou Ning. Communications Principle [M]. Beijing: Tsinghua University Press, 2016.
Data of last amendment	August 2024

Principle and Application of CPLD/FPGA

Module designation	Principle and Application of CPLD/FPGA
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer Yang Chengdong
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experimental teaching Contact hour: 32 hours Including: Theoretical teaching: 16 hours Experiment teaching: 16 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	Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology, C Language Programming
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Understand the meaning, characteristics and principles of programmable logic devices, master the basic flow of Verilog HDL programming and design, and be able to use EDA software tools to realize the design of commonly used digital circuits on CPLDs, FPGAs and other chips. ● **Course Objective 2:** Able to utilize Verilog HDL language to complete practical and complex digital circuit system design with the help of EDA tools and by consulting references. ● **Course Objective 3:** Proficient in the use of Quartus II simulation software, able to create projects, input Verilog HDL code, through the synthesis, compilation, download, so that the FPGA development board to verify the corresponding code function ● **Course Objective 4:** Students are able to predict and simulate complex engineering problems through team communication and cooperation, using electronic information equipment and professional simulation software, and are able to analyze in depth the accuracy and

	limitations of the simulation results to provide theoretical support for further optimization of the model and solution of practical problems.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) ● Introduction to EDA technology. ● Hardware description languages. ● Advantages of EDA technology. ● FPGA and CPLD development process. ● Programmable logic devices. **Chapter 2 Program Structures and Data Types** (2 contact hours; 2 self-study hours) ● Verilog program structure. ● Data types. ● Verilog text rules. **Chapter 3 Behavioral Statement** (6 contact hours; 4 self-study hours) ● Explain the three descriptive styles of functional description statements. ● Process statements. ● Block statements. ● Case conditional statements. ● If conditional statements. ● Procedure assignment statements. ● Loop statements. ● Assignment and function statements. **Chapter 4 FPGA Hardware Implementation** (2 contact hours; 2 self-study hours) ● Creating a project. ● Synthesis and compilation. ● Timing simulation. ● Port adaptation. ● Downloading. **Chapter 5 Operators and Structure Description Statements** (4 contact hours; 4 self-study hours) ● Operational operators. ● Successive assignment statements. ● Example statements. ● Parameter passing statements. **Part B. Experimental teaching** (16 contact hours; 14 self-study hours)

	In order to help students better understand the concept, principle and application of CPLD/FPGA, and improve their practical skills, the following five typical experimental classes will be arranged: 1. System awareness experiment. (2 contact hours; 2 self-study hours) 2. Full adder design experiment. (4 contact hours; 4 self-study hours) 3. Encoder and decoder design experiment. (4 contact hours; 4 self-study hours) 4. Parallel-in-serial-out and serial-in-parallel-out shift register design experiments. (4 contact hours; 2 self-study hours) 5. State machine design experiment. (2 contact hours; 2 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 30%, including assignments (10%) and experiment (20%). Final assessment (closed-book written exam) accounts for 70%.
Reading list	**1. Required books** [1] Huang Jiye, Chen Long. EDA Technology and Verilog HDL [M]. Beijing: Tsinghua University Press, 2017. 2. **Reference books** [1] Zuo Guanfang, Wang Xinlei. Embedded system experiment guide tutorial [M]. Zhenjiang: Jiangsu University Press, 2021.
Data of last amendment	August 2024

Intelligent Information Processing

Module designation	Intelligent Information Processing
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Yang Bin
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 40 hours Including: Theoretical teaching: 32 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 75 hours Contact hours = 40 hours Self-study hours = 35 hours
Credit points	2.5
Required and recommended prerequisites for joining the module	Advanced Mathematics Ⅰ, Signals & Systems Ⅰ, Linear Algebra, Probability Theory and Statistics
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Understand the concepts and applications of artificial intelligence, and provide an overview of methods for intelligent information processing. 2. Familiarize oneself with the fundamentals of model theory, fuzzy rules, and inference; understand fuzzy inference systems and their applications in daily life. ● **Skill:** 1. Master the basic theory and applications of rough sets, and understand their applications. 2. Master the basic algorithms and improved algorithms of genetic algorithms, and understand their applications. 3. Master the models and algorithms of information fusion, and understand their applications. ● **Competence:**

	1. Understand reverse selection algorithms and artificial immune system models. 2. Understand the applications of artificial immune systems in computer security.
Content	**Part A. Theoretical teaching** (32 contact hours; 27 self-study hours) **Chapter 1 Fuzzy Information Processing** (4 contact hours; 3 self-study hours) ● Fuzzy Model for Fault Diagnosis of Electrical Equipment ● Multi-Objective Fuzzy Optimization Methods ● Fuzzy Entropy Methods for Data Processing ● Adaptive Fuzzy Clustering Analysis ● Fuzzy Association Analysis ● Fuzzy Information Optimization Methods ● Fuzzy Proximity Methods for Fuzzy Multi-Attribute Decision Making ● Fuzzy Decision Integration Model with Incomplete Information ● Fuzzy Petri Nets **Chapter 2 Neural Network Information Processing** (8 contact hours; 6 self-study hours) ● General Model of Neural Networks ● BP Neural Network Model ● Bayesian Neural Network ● RBF Neural Network ● Bayesian-Gaussian Neural Network for Nonlinear System Identification ● Generalized Neural Network ● Engine Neural Network BP Algorithm Modeling ● Combined Grey Neural Network Model **Chapter 3 Rough Set Information Processing** (6 contact hours; 5 self-study hours) ● Fundamentals of Rough Set Theory ● Rough Fuzzy Sets ● Rough Set Neural Networks ● Rough Set Algorithm for Bayesian Classifiers ● Rough Set Methods for System Evaluation ● Rough Set Algorithms for Text Recognition ● Rough Set Methods for Image Median Filtering ● Grey Rough Set Model and Fault Diagnosis **Chapter 4 Genetic Algorithms and Their Applications**

	(5 contact hours; 4 self-study hours) ● Fundamentals of Genetic Algorithms ● Analysis of Genetic Algorithms ● Genetic Algorithm Solutions for the TSP Problem ● Genetic Neural Algorithms for Neural Networks ● Complex Encoding Genetic Algorithms ● Parallel Genetic Algorithms ● Backtracking Genetic Algorithms ● Coevolutionary Genetic Algorithms **Chapter 5 Information Fusion Technologies and Their Applications** (4 contact hours; 4 self-study hours) ● Overview of Multi-Sensor Information Fusion ● Information Fusion Models and Algorithms ● Bayesian Information Fusion Methods ● Fuzzy Decision Fusion Algorithms for Information ● D-S Algorithms for Information Fusion ● Vague Set Fuzzy Information Fusion ● Neural Network Models and Algorithms for Information Fusion ● Fuzzy Neural Petri Net Models for Information Fusion **Chapter 6 Immune Algorithms** (5 contact hours; 5 self-study hours) ● Fundamentals of Immune Algorithms ● Design of Immune Algorithms ● Immune Algorithms for Multi-Objective Flow-Shop Problems ● Path Immune Planning Algorithms ● Adaptive Immune Enhancement Algorithms for Images ● Immune Planning Algorithms for Power Grids ● Immune Computation for Optimal Power Flow in Power Systems **Part B. Experiment teaching** (8 contact hours; 6 self-study hours) To help students better understand the concepts and principles of Intelligent Information Processing, an experimental system will be constructed using electronic information expertise. The experiments will be conducted safely and reliably to enhance students' practical skills. The following three typical laboratory sessions will be arranged: 1. Python Programming Fundamentals Experiment. (2 contact hours; 2 self-study hours) 2. K-nearest neighbor algorithm and decision tree algorithm

	experiments. (2 contact hours; 2 self-study hours) 3. Naive Bayes algorithm and logistic regression algorithm experiments. (2 contact hours; 2 self-study hours) 4. Support Vector Machine Algorithm and AdaBoost Meta Algorithm Experiment. (2 contact hours; 2 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. Classroom learning discussion and post class feedback performance accounts for 40%. Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Xiong Hejin and Chen Dejun. Intelligent Information Processing [M]. Beijing: National Defense Industry Press, 2016. 2. **Reference books** [1] Yang Qiang. Introduction to Explainable Artificial Intelligence [M]. Beijing: Electronic Industry Press, 2022. [2] Gao Jun. Introduction to Intelligent Information Processing Methods [M]. Beijing: Machinery Industry Press, 2004. [3] Yan Pingfan and Zhang Changshui. Artificial Neural Networks and Simulated Evolutionary Computation [M]. Beijing: Tsinghua University Press, 2000. [4] Wang Wansen. Principles and Applications of Artificial Intelligence [M]. Beijing: Electronic Industry Press, 2000.
Data of last amendment	August 2024

Engineering Ethics

Module designation	Engineering Ethics
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Hu Changyu
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 16 hours Including: Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 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	Learning outcomes: ● **Course Objective 1:** To develop an in-depth understanding of the concepts and theories related to engineering ethics and to develop an awareness of engineering ethics among relevant practitioners. Be able to analyze and evaluate the social, health, safety, legal, and cultural implications of engineering practices and solutions to complex engineering problems in the field of EE, and the impact of these constraints on project implementation, and understand the responsibilities to be assumed. ● **Course Objective 2:** To systematically grasp the basic norms of engineering ethics and to master the requirements of ethical norms in specific engineering fields. Be able to think about the sustainability of engineering practices in the EE program from an environmental and social sustainability perspective, evaluating the potential

	human and environmental impacts over the product cycle. ● **Course Objective 3:** Improve overall decision-making skills in engineering ethics and be able to address complex ethical issues in engineering practice. Have humanities and social sciences literacy, sense of social responsibility, abide by the ethics and norms of the engineering profession, and respect the relevant national and international prevailing laws and regulations.
Content	**Theoretical teaching** (16 contact hours; 14 self-study hours) **Chapter 1 Introduction to Engineering Ethics** (4 contact hours; 4 self-study hours) ● Connotation of engineering. ● Relationship between science, technology and engineering. ● Characteristics of engineering. ● Ethical issues in engineering. **Chapter 2 Engineering Systems Approach** (4 contact hours; 4 self-study hours) ● Meaning and classification of engineering methods. ● Systems approach to engineering. ● Overview of the systems approach to engineering and methods of analysis. ● Methods of Engineering Evaluation. **Chapter 3 New Ideas and Approaches to Engineering** (4 contact hours; 3 self-study hours) ● Innovation in engineering activities. ● Inductive approach with its engineering innovations. ● Analogical approach and its engineering innovations. ● Retrospective methods and their engineering innovations. **Chapter 4 Engineering Risks and Their Main Responsibilities** (4 contact hours; 3 self-study hours) ● Engineering risks and their causes. ● Subjective cognitive bias of engineering risks. ● Subjects' responsibilities in engineering risks.
Examination forms	Report
Study and examination requirements	Class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance including assignments and class performance accounts for 50%.

	Report accounts for 50%.
Reading list	**1. Required books** [1] Yan Kunru. Engineering Ethics [M]. Guangzhou: South China University of Technology Press, 2016. 2. **Reference books** [1] Zhang Hengli. Tutorial on Engineering Ethics [M]. Beijing: China Social Science Press, 2023. [2] Xu Haitao. Engineering Ethics [M]. Beijing: Electronic Industry Press, 2020. [3] Gu Jian. Engineering Ethics [M]. Shanghai: Tongji University Press, 2015.
Data of last amendment	August 2024

Engineering Project Management and Economic Decision Making

Module designation	Engineering Project Management and Economic Decision Making
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer Cao Yue
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 16 hours Including: Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-120 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	Engineering Creativity
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Covers features and life cycles of projects, and introduces project managers' roles and competencies. 2. Involves project charter, management plans, monitoring, change control, and closure. 3. Includes scope definition, WBS creation, schedule planning/control, and cost estimation/budget management. ● **Skill:** 1. Ability to reasonably analyze and evaluate the impacts of electronic information engineering practices on environmental and social sustainability. 2. Ability to understand and adhere to professional engineering ethics and standards of honesty, fairness, and integrity in electronic information engineering practice. 3. Ability to master engineering management principles and

	economic decision-making methods relevant to electronic information-related fields. 4. Ability to recognize the cost composition throughout the entire lifecycle and processes of electronic information engineering and products, and to understand and describe associated engineering management and economic decision-making issues. ● **Competence:** 1. Capable of considering various constraints in optoelectronic engineering projects. 2. Understand and master fundamental engineering project management knowledge, recognize the impacts of engineering practices on the environment and society, and stimulate students' interest in engineering projects. 3. Understand and master economic decision-making methods tailored to the characteristics of optoelectronic engineering projects, emphasizing data-driven decision-making and developing students' ability to apply economic data and analytical tools to support project decisions. 4. Possess organizational, management, and coordination skills for handling complex optoelectronic engineering projects.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) ● Understand the basic concepts and characteristics of projects and engineering projects. ● Classification of engineering projects. ● Life cycle and infrastructure. ● Project management process group and knowledge field. **Chapter 2 Project Manager and Project Organization** (4 contact hours; 3 self-study hours) ● Definition of the project manager. ● The influence of the project manager. ● Capability of the project managers. ● Execute integration. **Chapter 3 Project Integration Management** (2 contact hours; 2 self-study hours) ● Formulate the constitution of the project. ● Develop a project management plan. ● Guide and manage the project work. ● Monitor project work.

	● Implement the overall change control. ● End of the project or phase. **Chapter 4 Project Scope Management** (2 contact hours; 2 self-study hours) ● Planning scope management. ● Collect requirements. ● Define scope. ● Create the Work Breakdown Structure (WBS). ● Confirm the scope. ● Control scope. **Chapter 5 Project Progress Management** (4 contact hours; 3 self-study hours) ● Planning progress management. ● Defining activities. ● Sequence the activities. ● Estimate the activity duration. ● Develop the project schedule. ● Control progress. **Chapter 6 Project Cost Control** (2 contact hours; 2 self-study hours) ● Planning cost management. ● Estimate costs.. ● Budgeting. ● Monitoring costs.
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 (25%) and research report (15%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**Reference books** [1] Bai Libiao. Modern Engineering Project Management [M]. China Machine Press, 2024. [2] Jeffrey K. Bintu. Project Management [M]. China Machine Press, 2018.
Data of last amendment	August 2024

Engineering Creativity

Module designation	Engineering Creativity
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Associate Professor Yang Chengdong
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 16 hours Including: Theoretical teaching: 16 hours Experiment teaching: 0 hours Computer practice: 0 hours Size of class: 80-120 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	None
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Covers key concepts, research purposes and content, and the relationship between creativity studies, traditional science, and holistic education, including its key characteristics and development models. 2. Encompasses the definitions and processes of thinking and creative thinking, methods for cultivating creativity, and the basic principles and practical techniques involved in invention. 3. Focuses on acquiring research topics, conceptualizing project proposals, and executing the necessary steps to complete creative projects. ● **Skill:** 1. Able to complete the design of electronic information devices and systems, incorporating innovative thinking in the process. 2. Able to select research paths and design experimental plans

	based on the characteristics and application requirements of electronic information devices and systems. 3. Able to apply engineering management principles or economic decision-making methods and tools to multidisciplinary engineering design and practice. 4. Able to understand relevant technical challenges based on personal or professional development needs, with the capacity to synthesize information and identify new challenges. ● **Competence:** 1. Understand and master knowledge related to creativity development, creative thinking and training, creative principles and techniques, and the implementation process of innovation and invention, thereby stimulating students' interest in invention and innovation. 2. Be adept at analyzing practical problems, with the ability to independently propose solutions and creatively apply knowledge to resolve issues. 3. Understand and master the creative principles and methods within the field of electronic information engineering, and apply them in a multidisciplinary environment. 4. Be capable of creatively formulating professional challenges in a multidisciplinary setting.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study hours) **Chapter 1 Overview of Creativity Studies** (4 contact hours; 3 self-study hours) ● Concepts, scope, and evolution of creativity studies. ● Relationship between creativity, traditional science, and holistic education. ● Students will understand the scope, objectives, and essential principles of creativity research. ● Grasp connections between creativity studies and conventional sciences. **Chapter 2 Creativity and Its Development** (2 contact hours; 2 self-study hours) ● Core attributes of creativity and motivations for developing it. ● Models and pathways for enhancing creativity. ● Students will comprehend key characteristics of creativity. ● Explore strategies and techniques to foster personal and group creativity. **Chapter 3 Creative Thinking and Training**

	(4 contact hours; 3 self-study hours) ● Definition of creative thinking versus logical thinking. ● Phases of creative thinking and practical training methods. ● Develop an understanding of creative thinking processes. ● Acquire practical ways to nurture and strengthen creative-thinking skills. **Chapter 4 Creativity Principles and Techniques** (4 contact hours; 3 self-study hours) ● Foundational creativity principles (combination, decomposition, analogy, etc.). ● Common creativity methods: brainwriting, association, morphological analysis, listing, and analogy techniques. ● Master fundamental creativity principles. ● Employ specific creativity techniques for problem-solving in multidisciplinary projects. **Chapter 5 Implementation Processes of Invention and Innovation** (2 contact hours; 3 self-study hours) ● Topic selection, conceptual design, and solution prototyping. ● Completing the invention process: documentation, testing, and possible patent considerations. ● Understand the step-by-step approach to identifying, structuring, and finalizing an innovative project. ● Link creativity methods to practical engineering contexts.
Examination forms	Final major paper.
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%, including class participation (20%) and assignment (10%). The final major paper accounts for 70% of the total grade.
Reading list	**Reference books** [1] Guo Yecai. Engineering Creativity [M]. Beijing: Tsinghua University Press, 2017. [2] Jing Yongteng. Brief Textbook on the Fundamentals of Creativity [M]. Harbin: Harbin Engineering University Press, 2017.
Data of last amendment	August 2024

Artificial Intelligence and Information Technology

Module designation	Artificial Intelligence and Information Technology
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Associate Professor Wang Shouyu
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment 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	Linear Algebra, Probability Theory and Statistics, Information Theory and Coding
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Understand the basic concepts of pattern recognition, machine learning, and deep learning. 2. Master the key methods of pattern recognition, machine learning, and deep learning. ● **Skill:** 1. Be able to complete the design of electronic information devices and systems, incorporating innovative thinking into the design. 2. Be able to analyze solutions to complex engineering problems in the field of electronic information through literature review, theoretical analysis, and numerical simulation, based on the requirements of electronic information devices and systems. ● **Competence:** 1. Master the application areas of pattern recognition, machine

	learning, and deep learning. 2. Be able to appropriately select and use the necessary instruments, simulation software, and information resources to analyze, compute, and design complex engineering problems related to electronic information devices and systems.
Content	**Part A. Theoretical teaching** (24 contact hours; 24 self-study hours) **Chapter 1 Introduction** (4 contact hours; 4 self-study hours) ● Overview of Artificial Intelligence and Information Technology ● Definition and Characteristics of Artificial Intelligence ● Major Schools of Artificial Intelligence ● Research Scope and Application Areas of Artificial Intelligence **Chapter 2 Introduction to Pattern Recognition** (6 contact hours; 6 self-study hours) ● Basic Concepts of Pattern Recognition ● Development History of Pattern Recognition ● Fundamental Methods of Pattern Recognition ● Application Areas of Pattern Recognition **Chapter 3 Introduction to Machine Learning** (6 contact hours; 6 self-study hours) ● Basic Concepts of Machine Learning ● Classification of Machine Learning ● Fundamental Methods of Machine Learning ● Applications of Machine Learning **Chapter 4 Introduction to Deep Learning** (8 contact hours; 8 self-study hours) ● Basic Concepts of Deep Learning ● Basic Structure of Neural Networks ● Forward Propagation and Backpropagation ● Major Types of Deep Learning **Part B. Experiment teaching** (8 contact hours; 4 self-study hours) To help students better understand the concepts and principles of Artificial Intelligence and Information Technology, an experimental system will be constructed using electronic information expertise. The experiments will be conducted safely and reliably to enhance students' practical skills. A comprehensive practical course on modern information processing based on artificial intelligence technology will be arranged.
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. Classroom learning discussion and post class feedback performance accounts for 40%. Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Yao Qizhi. Artificial Intelligence [M]. Beijing: Tsinghua University Press, 2022. 2. **Reference books** [1] Li Deyi. Introduction to Artificial Intelligence [M]. Beijing: China Science and Technology Press, 2018.
Data of last amendment	August 2024

C Language Programming II

Module designation	C Language Programming II
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Hu Changyu
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 16 hours Experiment teaching: 16 hours Size of class: 40 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	C Language Programming
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. The basic concepts of C++ programming, such as variables, data types, functions, and the definition of classes and objects. 2. The principles and application scenarios of function overloading and inline functions in C++ ● **Skill:** 1. Be able to define and use variables, data types, and functions in C++. 2. Be able to implement function overloading and inline functions and apply them to practical problems. ● **Competence:** 1. Define classes in C++ and create and use class objects to solve practical problems. 2. Design and implement simple programs using C++ programming methods.
Content	**Part A. Theoretical teaching** (16 contact hours; 14 self-study

	hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) ● The development of computer programming languages. ● Object-oriented methods. ● Object-oriented software development. ● Basic concepts of program development. **Chapter 2 Simple C++ Programming** (4 contact hours; 4 self-study hours) ● Overview of the C++ language. ● Basic data types and expressions. ● Data input and output. ● Basic control structures of algorithms. ● User-defined data types. **Chapter 3 Functions** (6 contact hours; 4 self-study hours) ● Definition and use of functions. ● Inline functions. ● Functions with default parameter values. ● Function overloading. ● C++ system functions. **Chapter 4 Classes and Objects** (4 contact hours; 4 self-study hours) ● Basic characteristics of object-oriented programming. ● Classes and objects. ● Constructors and destructors. ● Class composition. ● UML diagram notation. ● Structures and unions. **Part B Experiment teaching** (16 contact hours; 14 self-study hours) The following three typical experimental classes will be arranged: 1. Visual C++ 6.0 Integrated Development Environment and Simple C++ Programs. (4 contact hours; 4 self-study hours) 2. Application of Functions. (6 contact hours; 5 self-study hours) 3. Classes and Objects. (6 contact hours; 5 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 40%, including in-class performance (15%), experiment performance (15%) and assignments (10%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Tan Haoqiang. C++ Programming (3rd Edition) [M]. Beijing: Tsinghua University Press, 2015. **2. Reference books** [1] Lippman, Stanley B. C++ Primer (5th Edition, Chinese Version) [M]. Beijing: Publishing House of Electronics Industry, 2013 [2] Mingri Technology. C++ from Beginner to Master (5th Edition) [M]. Beijing: Tsinghua University Press, 2021. [3] Tan Haoqiang. C++ Programming (4th Edition) [M]. Beijing: Tsinghua University Press, 2024.
Data of last amendment	August 2024

Digital Image Processing

Module designation	Digital Image Processing
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Li Chen
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment 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	Probability Theory and Statistics, Fundamentals of Circuit Analysis
Module objectives/intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Students are able to proficiently use mathematics, natural sciences (especially signal processing and probability statistics), and computational analysis methods (e.g., algorithm design and optimization, machine learning, etc.) to compare and synthesize solutions for different digital image processing techniques. In doing so, they will be able to reflect advanced technologies in the field of electronic information, such as the application of deep learning in image recognition and classification, and the advantages of efficient algorithms in real-time image processing. ● **Course Objective 2:** Students are able to analyze complex image engineering problems in the field of electronic information by applying the basic principles and methods of digital image processing (e.g., image transformation, filtering, edge detection, segmentation, feature

	extraction, etc.), and by comprehensively considering a variety of influencing factors such as image quality, processing speed, and resource consumption. Through the practical projects, students can learn to select and optimize the solutions to the problems, such as designing appropriate image pre-processing and post-processing processes for different application scenarios. ● **Course Objective 3:** During the design of digital image processing systems and devices, students will be able to demonstrate a sense of innovation to optimize system performance by improving existing algorithms, proposing new algorithms, or integrating multidisciplinary techniques (e.g., computer vision and artificial intelligence). The course design will include open-ended projects that encourage students to explore uncharted territories and design and implement innovative image processing systems or solutions. ● **Course Objective 4:** Students are able to skillfully use digital image processing equipment and professional simulation software MATLAB to predict and simulate complex engineering problems. Through simulation experiments, students are able to gain an in-depth understanding of how image processing algorithms perform under different conditions, including their effectiveness and limitations. In addition, students need to have the ability to explain the principles behind these limitations, providing a theoretical basis for further optimization of algorithms and systems.
Content	**Part A. Theoretical teaching** (24 contact hours; 21 self-study hours) **Chapter 1 Introduction** (2 contact hours; 2 self-study hours) ● Digital images and digital image processing. ● Composition of digital image processing system. ● Basic contents of image processing technology research. ● Application areas of image processing technology. ● Fundamentals of MATLAB and its applications. **Chapter 2 Fundamentals of Digital Image Processing** (2 contact hours; 2 self-study hours) ● Electromagnetic spectrum and visible spectrum. ● Luminance visual properties of the human eye. ● Representation of images. ● Spatial resolution and gray scale resolution. ● Relationship between pixels.

	● Display of images. ● Image file formats. **Chapter 3 Basic Operations on Digital Images** (2 contact hours; 2 self-study hours) ● Gray scale inversion. ● Logarithmic transformation. ● Gray scale histogram. ● Algebraic operations on images. ● Geometric operations on images. **Chapter 4 Spatial Domain Image Enhancement** (4 contact hours; 3 self-study hours) ● Image enhancement methods based on point operations. ● Histogram based image enhancement method. ● Spatial smoothing filter-based image enhancement methods. ● Image enhancement method based on spatial sharpening filter. **Chapter 5 Frequency Domain Image Processing** (2 contact hours; 2 self-study hours) ● Two-dimensional discrete Fourier transform. ● The basic idea of frequency domain image processing. ● Frequency domain-based image noise removal. ● Frequency domain-based image enhancement. **Chapter 6 Image Recovery** (2 contact hours; 2 self-study hours) ● Degradation modeling of images. ● Inverse filter image recovery. ● Wiener filter image recovery. ● Image noise and noise contaminated image recovery. ● Image geometric distortion correction. **Chapter 7 Image Compression Coding** (2 contact hours; 2 self-study hours) ● Fundamentals of digital image compression coding. ● Basic variable length coding methods. ● Image quality evaluation. **Chapter 8 Image Segmentation** (2 contact hours; 2 self-study hours) ● Concept of image segmentation. ● Image segmentation based on edge detection. ● Region based image segmentation. **Chapter 9 Image Feature Extraction** (2 contact hours; 2 self-study hours)

	● Image feature extraction overview. ● Low-level visual feature extraction. ● High-level semantic feature extraction. **Chapter 10 Indication and Presentation of Objectives** (4 contact hours; 2 self-study hours) ● Basic concepts of target representation. ● Feature extraction and target description. ● Advanced target representation. **Part B. Experimental teaching** (8 contact hours; 7 self-study hours) In order to help students better understand the concept and principle of digital image processing, and improve their practical skills, the following typical experimental class will be arranged: 1. Comprehensive practice of digital image processing. (8 contact hours; 7 self-study hours)
Examination forms	Closed-book written exam
Study and examination requirements	After-class assignment shall be done independently by students during each class. No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 40%, including assignments (10%) and experiment (30%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**1. Required books** [1] Li Junshan. Digital Image Processing [M]. Beijing: Tsinghua University Press, 2021. 2. **Reference books** [1] Kenntth. R. Castleman. Digital Image Processing [M]. Beijing: Electronic Industry Press, 2000. [2] Rafael C. Gonzalez. Digital Image Processing (MATLAB Version) [M]. Beijing: Electronic Industry Press, 2005.
Data of last amendment	August 2024

Embedded System Design

Module designation	Embedded System Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Professor Gu Jing
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 80-120 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	Microcomputer Principles and Single-Chip Microcomputer Technology, Modern Sensor Technology
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Describe architectures, tool chains and application domains of modern embedded systems. 2. Explain the internal structure of the ARM Cortex-M3 core and the peripheral architecture of the STM32F1 MCU family. ● **Skill:** 1. Design and debug embedded hardware–software subsystems that employ GPIO, clocks, interrupts and timers. 2. Use C language, CMSIS/Std-Peripheral Library and Keil IDE to realize real-time control tasks and measure their timing and power behavior. ● **Competence:** 1. Verify embedded designs with simulation, laboratory instruments and code instrumentation; interpret limitations and propose improvements.

	2. Evaluate design choices against technical, economic, environmental and safety constraints and communicate results in written reports.
Content	**Part A. Theoretical teaching** (24 contact hours; 22 self-study hours) **Chapter 1 Embedded System Overview** (2 contact hours; 2 self-study hours) ● The concept, characteristics and application domains of embedded systems. ● Layered composition: hardware, RTOS and application software. ● Categories and selection of embedded processors. ● Typical design flow for an embedded project. **Chapter 2 ARM Cortex-M3 Architecture** (3 contact hours; 3 self-study hours) ● Thumb-2 instruction set and 3-stage pipeline. ● Register file, operating modes and privilege levels. ● Exception model, vector table and NVIC basics. ● Memory map and on-chip debug interface. **Chapter 3 STM32F1 Micro-controller Fundamentals** (3 contact hours; 3 self-study hours) ● STM32F1 system architecture and feature set. ● On-chip memory organisation and mapping. ● Boot configuration, power domains and reset sources. ● SWJ-DP debug port and programming tools. **Chapter 4 Reset and Clock Controller** (4 contact hours; 4 self-study hours) ● Clock-tree structure and selectable clock sources. ● PLL configuration, AHB/APB prescalers, and peripheral clocks. ● Std-Peripheral RCC library functions. ● Step-by-step system-clock initialisation procedure. **Chapter 5 GPIO Module** (4 contact hours; 3 self-study hours) ● GPIO port architecture and pin modes. ● Input, output and alternate-function configuration. ● Std-Peripheral GPIO APIs and practical coding patterns. ● Debouncing, drive strength and EMC considerations. **Chapter 6 Interrupts and Events** (4 contact hours; 3 self-study hours) ● Nested Vectored Interrupt Controller (NVIC) structure. ● External Interrupt/Event Controller (EXTI) lines 0–19.

	● Priority grouping, masking and latency analysis. ● Using NVIC and EXTI library functions to build interrupt services. **Chapter 7 General-Purpose Timer** (4 contact hours; 4 self-study hours) ● Timer functional blocks: clock source, prescaler, counter and update. ● Capture/compare channels and PWM generation. ● Std-Peripheral TIM APIs and configuration workflow. ● Timing accuracy, jitter sources and low-power operation techniques. **Part B. Experiment teaching** (8 contact hours; 6 self-study hours) To reinforce theoretical knowledge, cultivate hands-on competence and familiarize students with core STM32F103 peripherals in real embedded-system scenarios, the following three representative laboratory sessions are arranged: 1. Tool-Chain Setup and GPIO Fundamentals. (2 contact hours; 2 self-study hours) 2. External-Interrupt and Timer-PWM Application. (4 contact hours; 2 self-study hours) 3. System-Clock Configuration and Low-Power Profiling. (2 contact hours; 2 self-study hours)
Examination forms	Final major paper.
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 assignment (10%) and experiments (30%). Final assessment (final major paper) accounts for 60%.
Reading list	**Reference books** [1] Jean J. Labrosse. Embedded Real-Time Operating System uC/OS-II [M]. Beijing: Beihang University Press, 2007. [2] Liao Yikui. Embedded System Design Based on Cortex M3 STM32 [M]. Beijing: China Electric Power Press, 2012.
Data of last amendment	August 2024

Pattern Recognition and Machine Learning

Module designation	Pattern Recognition and Machine Learning
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Lecturer Yu Miao
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment 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	Advanced Mathematics I, Linear Algebra, Probability Theory and Statistics
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Understand the fundamental concepts, principles, algorithmic frameworks, and core methods in the fields of pattern recognition and machine learning. 2. Through systematic theoretical study, students should be able to establish a solid theoretical foundation, providing a strong base for subsequent practical applications and innovative research. ● **Skill:** 1. Apply the learned techniques in pattern recognition and machine learning to solve real-world problems, including data preprocessing, feature extraction, model selection, parameter tuning, and performance evaluation. 2. Be able to complete the design of electronic information devices and systems, incorporating innovative thinking into the design process.

	● **Competence:** 1. Master programming languages such as Matlab and Python. 2. Be capable of independently implementing algorithms, designing experiments, and performing data analysis.
Content	**Part A. Theoretical teaching** (24 contact hours; 24 self-study hours) **Chapter 1 Fundamentals of Bayesian Learning** (2 contact hours; 2 self-study hours) ● Bayes' Theorem ● Probability Models ● Bayesian Classification ● Bayesian Curve Fitting ● Model Selection and Regularization ● Bayesian Networks **Chapter 2 Logistic Regression** (2 contact hours; 2 self-study hours) ● Basic Concepts of Logistic Regression ● Sigmoid Function ● Model Construction ● Parameter Estimation ● Performance Evaluation ● Regularization and Model Selection **Chapter 3 Fundamentals of Probabilistic Graphical Models** (2 contact hours; 2 self-study hours) ● Definition and Classification of Probabilistic Graphical Models ● Representation and Construction of Graphs ● Probability Distributions and Inference ● Model Learning and Optimization ● Classical Models and Applications **Chapter 4 Hidden Markov Models** (2 contact hours; 2 self-study hours) ● Definition and Structure of Hidden Markov Models ● Three Basic Components of Hidden Markov Models ● Three Fundamental Problems of Hidden Markov Models **Chapter 5 Conditional Random Fields** (2 contact hours; 2 self-study hours) ● Definition and Properties of Conditional Random Fields ● Model Structure of Conditional Random Fields ● Algorithmic Implementation of Conditional Random Fields ● Feature Selection and Weight Adjustment in Conditional Random Fields

	Chapter 6 Support Vector Machines (2 contact hours; 2 self-study hours) ● Basic Concepts of Support Vector Machines ● Linearly Separable Support Vector Machines ● Linear Support Vector Machines ● Nonlinear Support Vector Machines ● Algorithmic Process of Support Vector Machines **Chapter 7 Artificial Neural Networks and Deep Learning** (4 contact hours; 4 self-study hours) ● Fundamentals of Artificial Neural Networks ● Multi-layer Perceptron (MLP) ● Fundamentals of Deep Learning ● Deep Learning Models ● Applications of Deep Learning **Chapter 8 Gaussian Processes** (2 contact hours; 2 self-study hours) ● Fundamentals of Gaussian Processes ● Mathematical Foundations of Gaussian Processes ● Modeling and Prediction with Gaussian Processes ● Properties and Advantages of Gaussian Processes **Chapter 9 Clustering** (2 contact hours; 2 self-study hours) ● Basic Concepts of Clustering ● Classification of Clustering Algorithms ● Performance Metrics ● Distance Calculation **Chapter 10 Principal Component Analysis and Related Spectral Methods** (4 contact hours; 4 self-study hours) ● Basic Concepts of Principal Component Analysis ● Mathematical Principles of Principal Component Analysis ● Algorithmic Steps in Principal Component Analysis ● Properties and Applications of Principal Component Analysis **Part B. Experiment teaching** (8 contact hours; 4 self-study hours) To help students better understand the concepts and principles of Artificial Intelligence and Information Technology, an experimental system will be constructed using electronic information expertise. The experiments will be conducted safely and reliably to enhance students' practical skills. The following three typical laboratory sessions will be arranged:

	1. Naive Bayes classifier experiment. (2 contact hours; 2 self-study hours) 2. Linear Support Vector Machine Classification Experiment. (3 contact hours; 1 self-study hours) 3. Artificial Neural Networks and Deep Learning Experiment. (3 contact hours; 1 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 40%, including course participation (15%), homework (10%), and experiments (15%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	1. Required books [1] Sun Shiliang and Zhao Jing. Pattern Recognition and Machine Learning [M]. Beijing: Tsinghua University Press, 2020. 2. Reference books [1] Zhang Xuegong. Pattern Recognition [M]. Beijing: Tsinghua University Press, 2022.
Data of last amendment	August 2024

Deep Learning

Module designation	Deep Learning
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer Li Chen
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Computer practice: 0 hours Size of class: 80-120 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	Pattern Recognition and Machine Learning
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Foundations of Deep Learning with PyTorch. 2. Advanced CNN Design and Vision Applications. 3. Sequence and Transformer Models for NLP and Multimodal Tasks. ● **Skill:** 1. Able to compare and synthesize solutions to engineering problems in the electronic- information field by applying foundational knowledge together with mathematical, scientific, and computational analysis methods, while reflecting the latest technologies in the discipline. 2. Capable of completing the design of electronic- information devices and systems and demonstrating a spirit of innovation throughout the process. 3. Able to select appropriate research paths and design

	experimental plans based on the characteristics and application requirements of electronic- information devices and systems. 4. Able to predict and simulate complex engineering problems using electronic- information instruments and specialized simulation software, and to explain the limitations of these methods. ● **Competence:** 1. Able to apply foundational deep- learning knowledge together with mathematics, natural sciences, and computational analysis methods to the electronic- information field. 2. With a solid grasp of deep- learning principles, students can creatively design electronic- information devices and systems, integrating deep- learning techniques and exhibiting independent thinking and innovation throughout the design process. 3. Students can, according to the specific characteristics and application requirements of electronic- information devices and systems, analyze and select the most suitable research route, design and implement experimental plans, and evaluate their effectiveness and feasibility. 4. Students are proficient in using electronic- information equipment and specialized simulation software to predict and model complex engineering problems, can thoroughly analyze the accuracy and limitations of the simulations, and thus provide theoretical support for further model optimization and practical problem- solving.
Content	**Part A. Theoretical teaching** (24 contact hours; 22 self-study hours) **Chapter 1 Introduction and PyTorch Basics** (2 contact hours; 2 self-study hours) ● Definition and evolution of AI and neural networks. ● Scope, advantages and typical applications of deep learning. ● Installing PyTorch; tensors and automatic differentiation. **Chapter 2 Perceptron — The Artificial Neuron** (2 contact hours; 2 self-study hours) ● Single- layer perceptron model and decision boundaries. ● Step, Sigmoid and ReLU activation functions. ● Gradient- descent learning rule implemented in PyTorch. **Chapter 3 Fully Connected Neural Networks** (2 contact hours; 3 self-study hours) ● Multi- layer architecture, forward propagation and

	back- propagation. ● Binary- and multi- class loss functions; weight initialisation. ● Over- fitting symptoms and basic regularisation techniques. **Chapter 4 Convolutional Neural Networks** (4 contact hours; 4 self-study hours) ● Convolution, padding, stride and receptive fields. ● Pooling operations and translation invariance. ● Design guidelines, batch- normalisation and dropout. **Chapter 5 Classic CNN Pre- trained Models and Transfer Learning** (4 contact hours; 3 self-study hours) ● AlexNet, VGG, ResNet, Inception: structures and innovations. ● Feature extraction vs. fine- tuning strategies in PyTorch. ● Practical image- classification example with a pre- trained model. **Chapter 6 Applications of Deep CNNs** (4 contact hours; 3 self-study hours) ● Face recognition pipeline and evaluation metrics. ● Semantic segmentation with FCN/U- Net; basics of object detection (YOLO/SSD). ● Introductory applications of Generative Adversarial Networks (GANs). **Chapter 7 Recurrent Neural Networks and LSTM** (4 contact hours; 3 self-study hours) ● Sequence- to- sequence modelling with vanilla RNN. ● LSTM gates, cell state and long- term dependency handling. ● Case studies: passenger- flow forecasting, text classification, text generation. **Chapter 8 Pre- trained Models for NLP** (2 contact hours; 2 self-study hours) ● Transformer architecture and self- attention. ● BERT fine- tuning for text understanding; GPT for text generation. ● Vision Transformer (ViT) concept and comparison with CNNs. **Part B. Experiment teaching** (8 contact hours; 6 self-study hours) To reinforce theoretical knowledge, cultivate practical competence, and help students master deep- learning techniques while becoming familiar with their applications in image recognition, speech recognition, natural- language processing, and related fields, the following three typical experimental classes will be arranged:

	1. Environment Configuration and Perceptron Experiments. (2 contact hours; 2 self‑ study hours) 2. CNN‑ based Gesture‑ Recognition Project. (4 contact hours; 2 self-study hours) 3. Bank‑ Customer Churn Prediction with ANN. (2 contact hours; 2 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 40%, including assignments (10%) and experiments (30%). Final assessment (closed-book written exam) accounts for 60%.
Reading list	**Reference books** [1] Meng Zuqiang, Ou Yuanhan. Deep Learning: Theory and Applications [M]. Beijing: Tsinghua University Press, 2023. [2] Qiu Xipeng. Neural Networks and Deep Learning [M]. Beijing: China Machine Press, 2021.
Data of last amendment	August 2024

Big Data Technology and Applications

Module designation	Big Data Technology and Applications
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Yu Wei
Language	Chinese
Relation to curriculum	Elective
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: theoretical teaching, experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 24 hours Experiment teaching: 8 hours Size of class: 40 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. The basic concepts, application areas of big data, and its interrelationship with cloud computing and the Internet of Things (IoT). 2. The concepts of big data storage, distributed file systems, NoSQL databases, and the differences between data warehouses and databases. ● **Skill:** 1. Be able to use distributed file systems and NoSQL databases for big data storage management. 2. Be able to understand and apply basic methods for big data processing and analysis. ● **Competence:** 1. Analyse big data storage management technologies and select appropriate solutions. 2. Apply big data processing and analysis methods to solve

	practical problems and understand their application scenarios.
Content	**Part A. Theoretical teaching** (24 contact hours; 20 self-study hours) **Chapter 1 Fundamentals of Big Data** (4 contact hours; 4 self-study hours) ● Basic concepts and application fields of big data. ● The interrelationship between big data, cloud computing, and the Internet of Things (IoT). **Chapter 2 Big Data Storage and Management** (6 contact hours; 4 self-study hours) ● Concepts and importance of big data storage. ● Distributed file systems (e.g., HDFS). ● NoSQL databases. ● Data warehouses and databases. ● Big data storage management technologies. **Chapter 3 Big Data Processing and Analysis** (10 contact hours; 8 self-study hours) ● Introduction to the Numpy module. ● Introduction to the Pandas module. ● Introduction to the Matplotlib module. **Chapter 4 Big Data Applications** (4 contact hours; 4 self-study hours) ● Applications of big data in the internet industry. ● Applications of big data in the biomedical field. ● Typical applications of big data in other industries. **Part B Experiment teaching** (8 contact hours; 8 self-study hours) The following two typical experimental classes will be arranged: 1. Comprehensive Application of Numpy and Pandas Modules. (4 contact hours; 4 self-study hours) 2. Comprehensive Application of Matplotlib Module. (4 contact hours; 4 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 30%, including assignments (10%) and experiment reports (20%). Final assessment (closed-book written exam) accounts for 70%.
Reading list	**1. Required books**

	[1] Jin Dawei. Introduction to Big Data Analytics (2nd Edition) [M]. Beijing: Tsinghua University Press, 2022. **2. Reference books** [1] Song Xudong. Fundamentals of Big Data Technology [M]. Beijing: Tsinghua University Press, 2020.
Data of last amendment	August 2024

English for General Purpose(1)

Module designation	English for General Purpose (1)
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Wei wen
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors on campus (except English majors) Type of teaching: 1. Communicative, Task-based, and Holistic language teaching methods 2. Multimedia instruction 3. Integration of textbook content with classroom language practice and learning strategy content 4. Integration of classroom instruction with independent learning platform learning 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	English for high school
Module objectives/intended learning outcomes	After completing the study of English for General Purpose (1), students will be able to realize the transition and transformation from high school English to university English teaching, adapt to the teaching mode and course requirements of university English, and begin to learn to learn independently and reduce their dependence on teachers. By the end of the study of English for General Purpose (1), students should be able to reach the first level of college English in terms of reading, writing, translation and other applications.
Content	**Chapter One Unit 1**

	1. Teaching Content *Integrated Course 1* Unit 1 The Pursuit of Dreams； *Viewing, Listening and Speaking 1* Unit 1 A New Journey in life **Chapter Two Unit 2** **1. Teaching Content** *Integrated Course 1* Unit 2 Freshman Year； *Viewing, Listening and Speaking 1* Unit 2 The magic of words **Chapter Three Unit 3** **1. Teaching Content** *Integrated Course 1* Unit 3 True Stories of Nazi Germany; *Viewing, Listening and Speaking 1* Unit 3 Culture links **Chapter Four Unit 4** **1. Teaching Content** *Integrated Course 1* Unit 4 Meeting Statesmen； *Viewing, Listening and Speaking 1* Unit 4 Life at fingertips
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. English for General Purpose (1) course assessment consists of: Formative assessment/Daily performance grades 40% + Result-based assessment/Final exam 60%.
Reading list	**1. Required books** [1] *New Progressive College English Comprehensive Practice 1*, edited by Liang Zhengxiao and others, published by Shanghai Foreign Language Teaching Press in March 2022. [2] *University English Listening Practice on the Go (Second Edition) Volume 1*, edited by Feng Yu et al, published by Shanghai Foreign Language Teaching Press in December 2023.
Data of last amendment	June, 2024

English for General Purpose(2)

Module designation	English for General Purpose (2)
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Wei wen
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors on campus (except English majors) Type of teaching: 1. Communicative, Task-based, and Holistic language teaching methods 2. Multimedia instruction 3. Integration of textbook content with classroom language practice and learning strategy content 4. Integration of classroom instruction with independent learning platform learning 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	English for General Purpose (1)
Module objectives/intended learning outcomes	Upon completion of the English for General Purpose (2) stage, students will be able to fully adapt to the teaching mode and course requirements of university English, form their own independent learning strategies and develop their independent learning abilities. By the end of the study of English for General Purpose (2), students should be able to reach the second level of college English in the application of reading, writing and translation.
Content	**Chapter One Unit 1** **1. Teaching Content**

	Integrated Course 2 Unit 1 Living Green； *Viewing, Listening and Speaking 1* Unit 5 The art of light and shadow **Chapter Two Unit 2** **1. Teaching Content** *Integrated Course 2* Unit 2 Tales of True Love； *Viewing, Listening and Speaking 1* Unit 6 Pursue your dreams **Chapter Three Unit 3** **1. Teaching Content** *Integrated Course 2* Unit 3 Friendships
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. English for General Purpose (2) course assessment consists of: Formative assessment/Daily performance grades 40% + Result-based assessment/Final exam 60%.
Reading list	**1. Required books** [1] *New Progressive College English Comprehensive Practice 2*, edited by Liang Zhengliu and others, published by Shanghai Foreign Language Teaching Press in March 2022. [2] *University English Listening Practice on the Go (Second Edition) Volume 1*, edited by Feng Yu et al, published by Shanghai Foreign Language Teaching Press in December 2023.
Data of last amendment	June, 2024

English for General Purpose(3)

Module designation	English for General Purpose (3)
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Wei wen
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors on campus (except English majors) Type of teaching: 1. Communicative, Task based, and Holistic language teaching methods 2. Multimedia instruction 3. Integration of textbook content with classroom language practice and learning strategy content 4. Integration of classroom instruction with independent learning platform learning 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	English for General Purpose (2)
Module objectives/intended learning outcomes	After completing the study of English for General Purpose (3), students will be able to realize the transition and transformation from high school English to university English teaching, adapt to the teaching mode and course requirements of university English, and begin to learn to learn independently and reduce their dependence on teachers. By the end of the study of English for General Purpose (3), students should be able to reach the first level of college English in terms of reading, writing, translation and other applications.
Content	**Chapter 1 Unit 1**

	1. Teaching Content *Integrated Course 3* Unit 1 Working Holiday Abroad *Viewing, Listening and Speaking 2* Unit 1 Campus Culture **Chapter 2 Unit 2** **1. Teaching Content** *Integrated Course 3* Unit 2 Conspicuous Consumption *Viewing, Listening and Speaking 2* Unit 2 Friendship we live by **Chapter 3 Unit 3** **1. Teaching Content** *Integrated Course 3* Unit 3 Cultural Differences *Viewing, Listening and Speaking 2* Unit 3 The art of communication
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. English for General Purpose (3) course assessment consists of: Formative assessment/Daily performance grades 40% + Result-based assessment/Final exam 60%.
Reading list	**1. Required books** [1] *New Progressive College English Comprehensive Practice 3*, edited by Liang Zhengxiao and others, published by Shanghai Foreign Language Teaching Press in March 2022. [2] *University English Listening Practice on the Go (Second Edition) Volume 2*, edited by Feng Yu et al, published by Shanghai Foreign Language Teaching Press in December 2023.
Data of last amendment	June, 2024

English for General Purpose(4)

Module designation	English for General Purpose (4)
Semester(s) in which the module is taught	4th semester
Person responsible for the module	Wei wen
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors on campus (except English majors) Type of teaching: 1. Communicative, Task based, and Holistic language teaching methods 2. Multimedia instruction 3. Integration of textbook content with classroom language practice and learning strategy content 4. Integration of classroom instruction with independent learning platform learning 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	English for General Purpose (3)
Module objectives/intended learning outcomes	Upon completion of the English for General Purpose (4) stage, students will be able to fully adapt to the teaching mode and course requirements of university English, form their own independent learning strategies and develop their independent learning abilities. By the end of the study of English for General Purpose (4), students should be able to reach the second level of college English in the application of reading, writing and translation.
Content	**Chapter 1 Unit 1** **1. Teaching Content**

	Integrated Course 3 Unit 4 Emerging Adulthood *Viewing, Listening and Speaking 2* Unit 4 On the Road **Chapter 2 Unit 2** **1. Teaching Content** *Integrated Course 3* Unit 5 Digital Age *Viewing, Listening and Speaking 2* Unit 5 Loving Family **Chapter 3 Unit 3** **1. Teaching Content** *Integrated Course 3* Unit 6 Determination *Viewing, Listening and Speaking 2* Unit 6 To be or Not to be
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. English for General Purpose (4) course assessment consists of: Formative assessment/Daily performance grades 40% + Result-based assessment/Final exam 60%.
Reading list	**1. Required books** [1] *New Progressive College English Comprehensive Practice 3*, edited by Liang Zhengliu and others, published by Shanghai Foreign Language Teaching Press in March 2022. [2] *University English Listening Practice on the Go (Second Edition) Volume 2*, edited by Feng Yu et al, published by Shanghai Foreign Language Teaching Press in December 2023.
Data of last amendment	June, 2024

Situation & Policy

Module designation	Situation & Policy
Semester(s) in which the module is taught	1st to 8th semester
Person responsible for the module	Qu Hua
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors in the university Type of teaching: This course primarily adopts thematic instruction, case-based teaching, and practice-oriented learning approaches. A variety of multimedia teaching materials will be developed using digital and online technologies, supplemented appropriately with video-based content to enhance the appeal of the course, increase student engagement, and ensure teaching quality. The course emphasizes interactive learning, employing diverse assessment methods such as in-class questioning, group discussions, and major assignments. Special attention is given to cultivating students' ability to apply theoretical knowledge to practical situations. Contact hour: 32 hours Including: Lecture Hours : 8 hours Online Learning Hourss : 24 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	Ideology, Morality and the Rule of Law; Modern Chinese History; Marxism Basic Theory; Introduction to Mao Zedong Thought and Theory of Socialism with Chinese Characteristics; Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era
Module objectives/intended learning outcomes	The "Situation & Policy" course primarily teaches the latest achievements in the Party's theoretical innovations, the vivid practices of upholding and developing socialism with Chinese characteristics in the new era, Marxist perspectives on national

	and international situations and policies, the Party's guidelines and policies, fundamental national conditions, and current major domestic and international issues. It aims to help students accurately understand contemporary Chinese Marxism, deeply grasp the historic achievements and challenges faced by the Party and the nation, and guide university students to correctly perceive the overarching trends in global and national development. The course also fosters an understanding of the uniqueness of the Chinese path in comparison with international models, a clear awareness of their responsibilities in the current era, and a grounded pursuit of long-term aspirations. Through this course, students are expected to develop a broad understanding of significant domestic and international events, comprehensively recognize and correctly interpret the Party's fundamental guidelines, policies, and strategies, understand the current context and national tasks, and keep pace with the pulse of the times. Additionally, the course aims to inspire patriotism, enhance national confidence and social responsibility, promote the value of national stability, disseminate the central policies of the Communist Party of China, firmly establish the "Four Consciousnesses" (political consciousness, overall awareness, core consciousness, and alignment consciousness), strengthen the "Four Self-confidences" (confidence in the path, theory, system, and culture of socialism with Chinese characteristics), and cultivate a new generation of youth ready to shoulder the great task of national rejuvenation.
Content	**Topic One: Forging the Consciousness of the Chinese National Community and Writing a New Chapter of Working Together to Realize the Chinese Dream** This chapter corresponds to Course Objectives 1, 2, and 3, and Ideological and Political Indicator Points 1, 2, and 3. **1. Teaching Content** National unity is the lifeline of people of all ethnic groups in China, and the consciousness of the Chinese national community is the foundation of national unity. The history of China is a history of the integration of various ethnic groups into the multi-ethnic Chinese nation, and a history of the common creation,

	development, and consolidation of a unified great motherland by all ethnic groups. Forging the consciousness of the Chinese national community is the main thread of the Party's ethnic work in the new era, as well as the main thread of all work in ethnic regions. Economic, political, cultural, social, ecological civilization construction, and Party building in ethnic regions must all closely revolve around and never deviate from this main thread. **Topic Two: Correctly Understanding the Historical Logic and Theoretical Logic of Chinese-Style Modernization** This chapter corresponds to Course Objectives 1, 2, and 3, and Ideological and Political Indicator Points 1, 2, and 3. **1. Teaching Content** The Communist Party of China has united and led the Chinese people to successfully advance the construction of Chinese-style modernization, creating a new form of human civilization. After a century of exploration, the Communist Party of China has forged a development path different from Western modernization. It is a path with distinct national characteristics, in line with China's national conditions, and focused on the common progress and development of China and the world. It is also the only successful modernization path explored independently by a developing country so far, based on its own culture and not dependent on Western civilization. China will always provide opportunities for world development with the achievements of Chinese-style modernization, offer new solutions for humanity's exploration of modernization paths, and make new contributions to the innovation of modernization theory and practice in human society. The continuous advancement of Chinese-style modernization will inject more positive energy and provide more new impetus for world development. **Topic 3: Studying Xi Jinping's Cultural Thought and Taking on the New Cultural Mission** This chapter corresponds to Course Objectives 1, 2, and 3, and Ideological and Political Indicator Points 1, 2, and 3. **1. Teaching Content** Since the 18th National Congress of the Communist Party of China, the CPC Central Committee with Comrade Xi Jinping at its core has strategically coordinated the overall landscape of the great rejuvenation of the Chinese nation and the profound global changes unseen in a century. It has accurately grasped the global

	trends of ideological and cultural interaction and the profound transformations in China's social thinking. From a strategic and comprehensive perspective, the Central Committee has systematically planned and deployed ideological and cultural work. General Secretary Xi Jinping has placed ideological and cultural work in a central position in the governance of the country. Centered on cultural development in the new era, he has put forward a series of new ideas, views, and judgments, which collectively form the cultural component of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, and have developed into what is now known as Xi Jinping's Cultural Thought. **Topic 4: The Situation in China's Ideological Field in the New Era and Safeguarding China's Ideological Security** This chapter corresponds to Course Objectives 1, 2, and 3, and Ideological and Political Indicator Points 1, 2, and 3. **1. Teaching Content** General Secretary Xi Jinping has issued the important directive of the "Seven Priorities" for ideological and cultural work, one of which is to "focus on building a socialist ideology with strong cohesion and leadership." Since the 18th National Congress of the Communist Party of China, the Party Central Committee has, from an overall and strategic height, made systematic plans and deployments for ideological and cultural work, promoting historic achievements in the cause of publicity, ideology, and culture in the new era. The situation in the ideological field has undergone comprehensive and fundamental transformations. The cultural confidence of the entire Party and people of all ethnic groups across the country has been significantly strengthened, and the spiritual outlook has become more vigorous and uplifted.
Examination forms	evaluation-based
Study and examination requirements	The "Situation & Policy" course is a compulsory course for all majors in the university. The assessment methods include: Pre-class online learning (20%) + In-class discussion and feedback (20%) + Outcome-based assessment (60%).
Reading list	[1] Teaching guidelines for the "Situation & Policy" course issued semiannually by the Department of Social Sciences of the Ministry of Education.

	[2] Documents from major central conferences and important speeches by central leadership. [3] ***Current Affairs Report (University Student Edition)***, ***Current Affairs Report*** VCDs. [4] Visual and audio materials for situation education issued irregularly by the Ministry of Education and other relevant departments. [5] ***People's Daily***, ***Banyuetan***, ***Current Affairs Data Handbook***, etc. [6] ***University Students' Guide to Contemporary Ideological Issues***.
Data of last amendment	August 2024

Ideology, Morality and the Rule of Law

Module designation	Ideology, Morality and the Rule of Law
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Zhang Yue
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All majors of Wuxi University Type of teaching: 1.Theoretical Lectures: Mainly delivered through lectures. 2.Multimedia Instruction: Appropriate use of multimedia for video demonstrations and showing educational films related to the course content. 3.Discussions: Conducted through teacher-guided group discussions to cultivate students' abilities in independent thinking and collaborative learning. 4.Practical Teaching: Completed in groups and presented in class; organizing reading activities where students recommend a good book they have read. 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	None
Module objectives/intended learning outcomes	The main objective of this course is to address the practical issues and concerns faced by contemporary university students. Through theoretical study and practical experience, with a focus on education in correct outlooks on life, values, moral concepts, and legal concepts, the course aims to help students form noble ideals and beliefs, uphold the great patriotic spirit, establish correct outlooks on life and values, firmly establish the core socialist values, cultivate good moral and legal qualities, further enhance

	their ability to distinguish right from wrong, good from evil, and beauty from ugliness, and strengthen their self-cultivation. This will lay a solid foundation in morality and law for students to gradually become qualified builders and reliable successors for the great cause of socialism with Chinese characteristics, achieving all-round development in morality, intelligence, physical fitness, and aesthetics.
Content	**Introduction: Shouldering the Responsibility of National Rejuvenation and Achieving Success as New-Era Individuals** This chapter corresponds to sub-objectives 1.1, 2.1, 3.1, and 3.2 of the course teaching objectives. **1.Teaching Content** "Ideology, Morality and the Rule of Law" is an ideological and political theory course that integrates ideology, politics, science, theory, and practicality. This course addresses the ideological, moral, and legal issues faced by college students during their growth, providing education on the Marxist worldview, outlook on life, values, moral concepts, and legal concepts. It aims to help college students enhance their ideological and moral qualities and legal literacy, enabling them to grow into new talents who consciously shoulder the great responsibility of national rejuvenation. Learning this course will assist students in comprehending the true meaning of life, grasping the direction of life, pursuing lofty ideals, firming up noble beliefs, inheriting fine traditions, promoting the Chinese spirit, cultivating and practicing socialist core values. It will also help students abide by moral norms, forge moral character, integrate correct moral cognition, conscious moral cultivation, and active moral practice, thereby leading good social trends. Furthermore, it will enable students to learn legal thoughts, develop legal thinking, and consciously respect, study, abide by, and apply the law, thus equipping them with excellent ideological and moral qualities and legal literacy. **Chapter 1: Understanding the True Meaning of Life and Grasping the Direction of Life** This chapter corresponds to sub-objectives 1.1, 2.1, 3.1, and 3.2 of the course teaching objectives. **2. Teaching Content** This chapter first guides college students to learn Marx's theory on the essence of human beings, clarifying that social

	attributes are the essential attributes of human beings, thereby grasping the dialectical relationship between the individual and society. It elucidates that the outlook on life encompasses three aspects: the purpose of life, attitude towards life, and the value of life, with a focus on explaining the dialectical relationship between the self-value and social value of life. It also emphasizes the significance for college students to establish a correct "three views" (worldview, outlook on life, and values), highlighting their meanings and mutual relationships. Secondly, based on an in-depth study of Marx's basic theories on life issues, this chapter clarifies what the purpose of life, attitude towards life, and the value of life should be for college students in terms of their outlook on life, urging them to firmly establish a scientific and noble purpose of life that "serves the people and contributes to society," cultivate a serious, pragmatic, optimistic, and enterprising attitude towards life, and learn to correctly evaluate the value of life, thereby truly realizing the value of college students' lives. Finally, this chapter also applies Marx's theory on the essence of human beings to analyze various life contradictions and difficulties that college students may encounter on their life journeys, advocating that students establish correct views on gain and loss, hardship and happiness, adversity and prosperity, life and death, and honor and disgrace, recognizing the harmfulness of erroneous outlooks on life such as money worship, hedonism, and extreme individualism, and striving to be in line with history, march with the motherland, and stay with the people, thus achieving a brilliant life for college students. **Chapter 2: Pursuing Lofty Ideals and Firming up Noble Beliefs** This chapter corresponds to sub-objectives 1.2, 2.2, 3.1 and 3.2 of the course teaching objectives. **2. Teaching Content** In the long journey of life, only by striving forward and working hard can one navigate through the rapids and reach the other shore of ideals. Scientific ideals and beliefs are both the lighthouse guiding people through the fog to identify their course and the sails inspiring them to brave the winds and waves and sail the vast ocean. University is a place for cultivating talents and nurturing virtues, where young people learn knowledge, enhance

	their abilities, and fulfill their dreams. Pursuing lofty ideals and firming up noble beliefs, and realizing personal ideals in the process of striving for the common ideal of socialism with Chinese characteristics, is not only a practical need for students' own growth but also the earnest expectation of the country and the people. **Chapter 3: Inheriting Fine Traditions and Promoting the Chinese Spirit** This chapter corresponds to sub-objectives 1.3, 2.3, 3.1 and 3.2 of the course teaching objectives. **2. Teaching Content** To realize the Chinese Dream of the great rejuvenation of the Chinese nation, it is essential to promote the Chinese spirit, which refers to the national spirit centered on patriotism and the spirit of the times centered on reform and innovation. Through the teaching and reflection in this chapter, students can deeply understand the value and content of the Chinese spirit, profoundly recognize the basic requirements of patriotism in the new era, realize that patriotism has always been the spiritual bond that firmly unites the Chinese nation, and that reform and innovation have always been the spiritual force driving reform, opening up, and socialist modernization. This chapter guides college students to combine their lofty personal ideals with a high sense of responsibility and mission towards the motherland, shoulder the era mission of national rejuvenation, strive to be loyal patriots and progressive individuals of the times, and showcase the youthful charm of the Chinese spirit through practical actions. **Chapter 4: Clarifying Value Requirements and Practicing Value Norms** This chapter corresponds to sub-objectives 1.4, 2.4, 3.1 and 3.2 of the course teaching objectives. **2. Teaching Content** The history of human social development shows that the most enduring and profound force for a nation and a country is the core values commonly recognized by the whole society. The socialist core values are the concentrated expression of the contemporary Chinese spirit, the value expression of the path, theory, system, and culture of socialism with Chinese

	characteristics, and embody the common value pursuit of the entire people. College students should deeply comprehend the important significance and scientific connotation of the socialist core values, fasten the buttons of life, start from daily details and subtle aspects, and become firm believers, active disseminators, and exemplary practitioners of the socialist core values. **Chapter 5: Abiding by Moral Norms and Forging Moral Character** This chapter corresponds to sub-objectives 1.5, 2.5, 3.1 and 3.2 of the course teaching objectives. **2. Teaching Content** For contemporary college students, the cultivation of moral qualities and the formation of excellent personalities are particularly important. Firstly, contemporary college students should learn the basic theories of morality, establish a Marxist moral outlook, and promote socialist morality. Secondly, in practice, they should consciously inherit the fine traditional virtues of the Chinese nation and the revolutionary virtues of China; in terms of space, they should consciously absorb and learn from the excellent moral achievements of humanity. Finally, they should transform morality into practice, specifically dividing it into four practical fields according to the basic principle of gradually expanding practice scope: abiding by social morality, adhering to professional ethics, promoting family virtues, and forging personal character. **Chapter 6: Learning Legal Thoughts and Enhancing Legal Literacy** This chapter corresponds to sub-objectives 1.6, 2.6, 3.1 and 3.2 of the course teaching objectives. **2. Teaching Content** The rule of law is an important symbol of human civilization and progress and a fundamental way of governing the country. When the rule of law thrives, the country thrives; when the rule of law is strong, the country is strong. In the process of comprehensively governing the country according to law and building a country under the rule of law, college students should learn Marxist legal theories, especially Xi Jinping Thought on the Rule of Law, deeply understand the essential characteristics and operational mechanisms of socialist law, grasp the essence of the socialist legal system with Chinese characteristics as a whole, respect and uphold the authority of the Constitution and laws,

	continuously enhance their legal literacy, and strive to be exemplary models in respecting, studying, abiding by, and applying the law.
Examination forms	Closed-book written exam
Study and examination requirements	The Ideology, Morality and the Rule of Law course is a compulsory course. Forms of the course assessment include discussion in class and feedback after class (40%)+result-based assessment(60%).
Reading list	1.Recommended Textbook: *Ideology, Morality, and Rule of Law*, compiled by the book writing team, Higher Education Press in 2023; 2.Reference Books and Literature: [1] *Excerpts from Xi Jinping's Discourses on Youth and Communist Youth League Work,* compiled by the Research Office of the Central Committee of the Communist Party of China, Central Party Literature Press in 2017. [2] *Xi Jinping and College Students*, compiled by the book's editorial team, China Youth Press in 2020. [3] *Speech at the Ceremony Commemorating the 200th Anniversary of Marx's Birth,* by Xi Jinping, People's Publishing House in 2018. [4] *Xi Jinping: The Governance of China*, by Xi Jinping, Foreign Languages Press in 2022. 3.Online Learning Resources: Chaoxing Learning Platform, China University MOOC.
Data of last amendment	August 2024

Modern Chinese History

Module designation	Modern Chinese History
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Li Qiannan
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All majors Type of teaching: Heuristic Teaching Method, Situational Teaching Method, Multimedia Teaching Method, Case Teaching Method Contact hour: 36 hours Including: Lecture Hours : 24 hours Extracurricular Learning Hours: 12 hours Size of class: 40-60 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	Ideology, Morality and the Rule of Law
Module objectives/intended learning outcomes	The course aims to enable students to understand the historical process and inherent laws of China's social development, revolution, construction, and reform in modern and contemporary times. It helps students gain insights into the history and national conditions of China, and comprehend how history and the people have chosen Marxism, the Communist Party of China, the socialist path, and reform and opening up. By doing so, the course assists students in establishing the belief that “only socialism can save China, and only socialism with Chinese characteristics can develop China,” thereby encouraging them to firmly uphold and develop socialism with Chinese characteristics.
Content	**Introduction: Overview of Modern and Contemporary Chinese History** **1. Teaching Content** (1) The importance of studying modern and contemporary

	Chinese history (2) An overview of modern and contemporary Chinese history (3) The purpose and requirements of studying the “Outline of Modern and Contemporary History in China” (4) Establishing and adhering to a scientific historical perspective **Chapter 1: The Tribulations and Struggles of the Chinese Nation After Entering Modern Times** This chapter corresponds to course objectives 1 and 2, and ideological and political indicators 1 and 2. **1. Teaching Content** (1) How did China and the world change before and after the Opium War? (2) What impact did the invasion of capital-imperialism bring to China? (3) How should we view the anti-invasion struggles of the Chinese people in modern times? (4) How was the dream of the great rejuvenation of the Chinese nation proposed? **Chapter 2: Early Explorations by Different Social Forces for the Way Forward for the Country** This chapter corresponds to course objectives 1, 2, and 3, and ideological and political indicators 1 and 2. **1. Teaching Content** (1) Why did the “Taiping Heavenly Kingdom Dream” of the peasant class fail? (2) Why did the "self-strengthening and wealth-seeking dream" of the landlord class’s Westernization faction fall through? (3) Why did the “reform and constitutional dream” of the bourgeois reformists come to an abrupt end? **Chapter 3: The Xinhai Revolution and the End of the Monarchical System** This chapter corresponds to course objectives 1 and 3, and ideological and political indicators 1 and 3. **1. Teaching Content** (1) The outbreak of the Xinhai Revolution was historically inevitable (2) The successes and failures of the Xinhai Revolution (3) The bourgeois republic scheme was unworkable in China **Chapter 4: The Founding of the Communist Party of China and a New Situation in the Chinese Revolution** This chapter corresponds to course objectives 1 and 2, and

	ideological and political indicators 1 and 2. **1. Teaching Content** (1) The outbreak of the Xinhai Revolution was historically inevitable (repeated from Chapter 3, but relevant to this chapter's context) (2) The successes and failures of the Xinhai Revolution (repeated from Chapter 3, but relevant to this chapter's context) (3) The bourgeois republic scheme was unworkable in China (repeated from Chapter 3, but relevant to this chapter's context) **Chapter 5: The New Path of the Chinese Revolution** This chapter corresponds to course objectives 1 and 2, and ideological and political indicators 1 and 3. **1. Teaching Content** (1) The New Culture Movement and the May Fourth Movement (2) The widespread spread of Marxism and the birth of the Communist Party of China (3) A new situation in the Chinese revolution (4) How to understand that the founding of the Communist Party of China was historically inevitable (5) Why is it said that the founding of the Communist Party of China brought a new look to the Chinese revolution? (6) How to understand that the founding and struggles of the Communist Party of China profoundly changed China and the world? **Chapter 6: The War of Resistance Against Japanese Aggression of the Chinese Nation** This chapter corresponds to course objectives 2 and 3, and ideological and political indicators 1 and 2. **1. Teaching Content** (1) How was the great wall of flesh and blood of the nationwide war of resistance built? (2) How should we view the role of the Kuomintang and the正面战场 (frontline battlefield) during the war of resistance? (3) Why is it said that the Communist Party of China was the mainstay of the Chinese nation's war of resistance against Japanese aggression? (4) How to understand that the Chinese people's war of resistance against Japanese aggression was the main eastern battlefield of the World Anti-Fascist War?

	(5) How to understand that the victory of the war of resistance opened up a bright prospect for the great rejuvenation of the Chinese nation? **Chapter 7: Struggling for the Establishment of New China** This chapter corresponds to course objectives 2 and 3, and ideological and political indicators 1 and 2. **1. Teaching Content** (1) What efforts did the Communist Party of China make to strive for peace and democracy? (2) Why could the Communist Party of China win the victory of the Liberation War? (3) Why did history choose the people's republic scheme? (4) What were the reasons, significance, and basic experiences of the victory of the Chinese New Democratic Revolution? **Chapter 8: The Founding of the People's Republic of China and the Exploration of China's Socialist Construction Path** This chapter corresponds to course objectives 1 and 2, and ideological and political indicators 2 and 3. **1. Teaching Content** (1) The founding of the People's Republic of China and the consolidation of the new people's regime (2) The Party's general line for the transition period and its implementation (3) The preliminary establishment of the basic socialist system (4) A good start for the comprehensive construction of socialism (5) The arduous exploration and tortuous development of the socialist path **Chapter 9: Reform and Opening Up and the Pioneering and Development of Socialism with Chinese Characteristics** This chapter corresponds to course objectives 2 and 3, and ideological and political indicators 1 and 2. **1. Teaching Content** (1) A historic great turning point and the beginning of reform and opening up (2) A new situation in reform and opening up and socialist modernization construction (3) Advancing socialism with Chinese characteristics into the 21st century (4) Upholding and developing socialism with Chinese characteristics under new circumstances **Chapter 10: Socialism with Chinese Characteristics Entering a**

	New Era This chapter corresponds to course objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Opening up broader prospects for the development of socialism with Chinese characteristics (2) Continuously advancing socialism with Chinese characteristics in the new era (3) Embarking on a new journey of comprehensively building a socialist modernized country
Examination forms	Closed-book written exam
Study and examination requirements	The course "Outline of Modern and Contemporary History in China" is a public compulsory course. The assessment methods for this course include: attendance (16%) + five regular assignments (12%) + in-class performance (12%) + final examination (60%).
Reading list	[1] *Selected Works of Mao Zedong (Volumes 1-4)*. Beijing: People's Publishing House, 1991. [2] *Selected Works of Deng Xiaoping (Volumes 1-3)*. Beijing: People's Publishing House, 1994. [3] Jiang Zemin. On Party Building. Beijing: Central Party Literature Press, 2001. [4] Research Office of Central Party Literature. *Selected Important Documents Since the Founding of the People's Republic of China*. Beijing: Central Party Literature Press, 1988-1995. [5] John King Fairbank. *The Cambridge History of China: Republican China 1912-1949*. Shanghai: Shanghai People's Publishing House, 1991. [6] Zhang Qizhi. *Chinese History: Late Qing and Republican Period*. Beijing: Higher Education Press, 2001. [7] Chen Xulu. *Metabolism in Modern Chinese Society*. Shanghai: Shanghai People's Publishing House, 1992. [8] John King Fairbank. *The Cambridge History of China: The People's Republic of China 1949-1965*. Shanghai: Shanghai People's Publishing House, 1992. [9] Jiang Tingfu. *A Modern History of China. Shanghai: Shanghai Ancient Books Publishing House*, 1999. [10] Hu Sheng. *From the Opium War to the May Fourth Movement*. Beijing: Hongqi Publishing House, 1983. [11] Lin Huaguo. *A Panoramic View of Modern History*. Beijing: Peking University Press, 2005.

	[12] Chow Tse-tsung. *The May Fourth Movement: Intellectual Revolution in Modern China*. Changsha: Yuelu Publishing House, 2000. [13] Mao Haijian. *The Collapse of the Celestial Empire: A Re-examination of the Opium War.* Beijing: SDX Joint Publishing Company, 2005. [14] Li Xin. *History of the Republic of China*. Beijing: Zhonghua Book Company, 1987. [15] Li Shiyue and Hu Bin. *From Seclusion to Opening Up: A Perspective on the "Westernization Movement" in the Late Qing Dynasty*. Beijing: People's Publishing House, 1988. [16] Paul A. Cohen. *History in Three Keys: The Boxers as Event, Experience, and Myth.* Nanjing: Jiangsu People's Publishing House, 2000. [17] John King Fairbank. *The Great Chinese Revolution, 1800-1985*. Beijing: World Affairs Press, 2000. [18] Robert Lawrence Kuhn. *He Changed China: The Life and Legacy of Jiang Zemin.* Shanghai: Shanghai Century Publishing Group and Shanghai Translation Publishing House, 2005. [19] Pang Xianzhi and Jin Chongji. *Mao Zedong: A Biography (1949-1976)*. Beijing: Central Party Literature Press, 2003. [20] Dick Wilson (UK). *Zhou Enlai*. Beijing: Central Party Literature Press, 2000. [21] Hu Sheng. *Seventy Years of the Communist Party of China*. Beijing: Party History Publishing House, 1991. [22] Karl Marx. *The History of the Opium Trade*. People's Publishing House, 1997. [23] John King Fairbank. *The Cambridge History of China: The Late Ch'ing 1800-1911*. Shanghai: Shanghai People's Publishing House, 1992. [24] Sun Yat-sen. *The International Development of China*. Huaxia Publishing House, 2002. [25] Xi Jinping. *Speech at the First Plenary Session of the 12th National People's Congress*, 2013. [26] Publicity Department of the Central Committee of the Communist Party of China. *Reader on a Series of Important Speeches by General Secretary Xi Jinping*. Learning Press and People's Publishing House, 2016.
Data of last amendment	August 2024

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	Qu Wentao
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: General Course for All Majors Type of teaching: Lecturing, multimedia teaching, thematic discussion, and case study 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	Ideology, Morality and the Rule of Law, Modern Chinese History
Module objectives/intended learning outcomes	This course serves as a crucial measure to thoroughly advance the integration of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era into textbooks, classrooms, and students' minds. It can more effectively assist college students in systematically grasping the main content and spiritual essence of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, enabling them to more consciously arm their minds, guide their practices, and facilitate their learning with this thought. By nurturing students' souls with Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, it aims to guide students in firmly establishing the "Four Consciousnesses," strengthening the "Four-Sphere Confidence," and resolutely upholding the "Two Maintenances." Ultimately, the course seeks to cultivate generation after generation of talented individuals

	who support the Communist Party of China and China's socialist system, and are committed to dedicating their lives to the cause of socialism with Chinese characteristics.
Content	**Introduction: A New Leap in the Sinicization of Marxism** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The scientific system and main content of Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era, and its historical significance. **Chapter 1: Adhering to and Developing Socialism with Chinese Characteristics in the New Era** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Socialism with Chinese Characteristics is the choice of history and the people. (2) Socialism with Chinese Characteristics is socialism, not any other form of ism. (3) Firmly maintain confidence in the path, theory, system, and culture of socialism with Chinese characteristics. (4) The new era of socialism with Chinese characteristics is the new historical orientation for China's development. (5) The transformation of the principal contradiction in society is a historic change that impacts the overall situation. (6) The great changes of the new era and their milestone significance. (7) Adhering to and developing socialism with Chinese characteristics in the new era must be consistent and continuous. (8) Coordinating the promotion of the "Five-in-One" overall layout and the "Four Comprehensive" strategic layout. (9) Advancing socialism with Chinese characteristics to continue its progress. **Chapter 2: Advancing the Great Rejuvenation of the Chinese Nation through Chinese-style Modernization** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The greatest dream of the Chinese nation since modern times. (2) Chinese-style modernization is the only correct path for

	building a strong country and realizing national rejuvenation. (3) Advancing Chinese-style modernization in a stable and long-term manner. **Chapter 3: Upholding the Party's Comprehensive Leadership** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The leadership of the Communist Party of China (CPC) is the most essential characteristic of socialism with Chinese characteristics. (2) Upholding the Party's leadership over all work. (3) Improving and perfecting the system of Party leadership. **Chapter 4: Upholding a People-Centered Approach** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Why must we adhere to a people-centered approach? (2) What does it mean to uphold a people-centered approach? (3) How should we uphold a people-centered approach? **Chapter 5: Comprehensively Deepening Reform and Opening Up** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Reform and opening up in the new era is a profound revolution. (2) Adhering to the correct direction for comprehensively deepening reform and opening up. (3) The general goals of comprehensively deepening reform. (4) The correct methodology for comprehensively deepening reform and opening up. **Chapter 6: Promoting High-Quality Development** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Fully, accurately, and comprehensively implement the new development philosophy. (2) Adhere to and improve the socialist basic economic system. (3) Accelerate the construction of a new development pattern. **Chapter 7: Education, Science, and Talent Strategy for Socialist Modernization** This chapter corresponds to course teaching objectives 1, 2, and 3,

	and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Understanding the major significance of the strategy of revitalizing the country through education, science, and technology in the new era. (2) How to accelerate the construction of a strong educational nation. (3) How to accelerate the construction of a strong technological nation. (4) How to deeply implement the strategy of building a strong country through talent in the new era. **Chapter 8: Developing Whole-Process People's Democracy** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Firmly adhere to the path of political development with Chinese characteristics. (2) Whole-process people's democracy is an essential attribute of socialist democratic politics. (3) The main content of the system of people being the masters of the country. (4) The significance of consolidating and developing the patriotic united front in the new era. **Chapter 9: Comprehensive Rule of Law in China** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The significance of comprehensively advancing the rule of law in China. (2) The core essence and basic principles of the socialist rule of law with Chinese characteristics. (3) The main content of the socialist rule of law system with Chinese characteristics. (4) The primary tasks in accelerating the construction of a rule-of-law-based China. **Chapter 10: Building a Socialist Cultural Power** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Cultural confidence is a powerful spiritual force for the great rejuvenation of the Chinese nation.

	(2) The fundamental system of maintaining the guiding position of Marxism in the ideological field. (3) The basic requirements for cultivating and practicing the core socialist values. (4) The prominent characteristics of Chinese civilization. **Chapter 11: Strengthening Social Construction with a Focus on People's Well-being** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Enhancing people's well-being through development. (2) Key focal points for improving people's quality of life. (3) The significance and requirements of strengthening and innovating social governance. **Chapter 12: Building Socialist Ecological Civilization** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Why build ecological civilization? (2) How to build ecological civilization? (3) Proposing China's plan for "Building a Global Ecological Civilization." **Chapter 13: Safeguarding and Shaping National Security** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) Why is guaranteeing national security considered a top priority? (2) What is the concept of overall national security? (3) How to advance the modernization of the national security system and capabilities? **Chapter 14: Strengthening National Defense and Building a Strong People's Army** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The significant importance of strengthening national defense and building a powerful People's Army. (2) The Party's military goals in the new era. (3) Adhering to the fundamental principle and system of the Party's absolute leadership over the People's Army.

	Chapter 15: Adhering to "One Country, Two Systems" and Advancing National Reunification This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The scientific connotation and significant importance of "One Country, Two Systems." (2) The successful practice of "One Country, Two Systems" in Hong Kong and Macau in the new era. (3) The overall strategy of the Party in resolving the Taiwan issue in the new era. **Chapter 16: Major-Country Diplomacy with Chinese Characteristics and Promoting the Building of a Community with a Shared Future for Mankind** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The impact of the unprecedented global changes in a century on China's foreign policy. (2) The principles and layout of comprehensively advancing major-country diplomacy with Chinese characteristics. (3) The basic content of major-country diplomacy with Chinese characteristics. (4) The rich connotation and value concept of building a community with a shared future for mankind. (5) The practical achievements in building a community with a shared future for mankind. **Chapter 17: Comprehensive and Strict Governance of the Party** This chapter corresponds to course teaching objectives 1, 2, and 3, and ideological and political indicators 1, 2, and 3. **1. Teaching Content** (1) The inevitability and significance of comprehensively and strictly governing the Party in the new era. (2) The main content of comprehensively and strictly governing the Party in the new era. (3) Resolutely advancing the fight against corruption. (4) Using the Party’s self-revolution to break free from the historical cycle. (5) Leading great social revolution through great self-revolution.
Examination forms	Closed-book written exam
Study and	The course is a required foundational course. The assessment

examination requirements	method for the course includes: Regular performance (40%) + Final assessment (60%). Regular performance components: (1) Attendance (25%) (2) Classroom participation and homework (25%) (3) One mid-term exam (50%)
Reading list	[1] Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Compilation Group, Higher Education Press [2] The Governance of China by Xi Jinping, Foreign Languages Press, 2017 Edition [3] The Governance of China by Xi Jinping, Foreign Languages Press, 2018 Edition [4] The Governance of China by Xi Jinping, Foreign Languages Press, 2020 Edition [5] Xi Jinping: Speech at the Ceremony Commemorating the Bicentenary of the Birth of Marx, People's Publishing House, 2018 Edition [6] Xi Jinping: Speech at the Ceremony Marking the Centenary of the Communist Party of China, People's Publishing House, 2021 Edition [7] Thirty Lectures on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, XUE XI CHU BAN SHE, 2018 Edition [8] Outline for Learning Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, XUE XI CHU BAN SHE & People's Publishing House, June 2019 [9] Explanatory Reader on the Resolution of the CPC Central Committee on the Major Achievements and Historical Experience of the Party's Centennial Struggle, People's Publishing House, November 2021 [10] Xi Jinping: Hold High the Great Banner of Socialism with Chinese Characteristics and Strive in Unity to Build a Modern Socialist Country in All Respects — Report to the 20th National Congress of the Communist Party of China (October 16, 2022) [11] Q&A on Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, XUE XI CHU BAN SHE & People's Publishing House, February 2021

	[12] Shared Online Course on Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era via Chaoxing Learning Platform [13] Xinhua News Agency: http://www.xinhuanet.com/ [14] People's Daily Online: http://www.people.com.cn/ [15] Online Resources such as "Xuexi Qiangguo": https://www.xuexi.cn/
Data of last amendment	August 2024

Marxism Basic Theory

Module designation	Marxism Basic Theory
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Jiao Xin
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All undergraduate majors Type of teaching:The teaching of this course will make full use of digital technology and network technology to produce colorful multimedia courseware, and appropriately combine video teaching at the right time to enhance the attractiveness of course learning and increase students' interest in learning. Carry out thematic teaching, broaden the teaching content. Focus on reforming teaching methods, using a combination of student preparation and lecturing, teacher guidance and comments, case studies, student speeches and debates, and changing from single-teacher classroom lectures to diversified teaching methods of teacher-student interactions, so as to allow students to participate in the teaching of the course and to improve the effectiveness of the ideological and political theory course. Emphasis is placed on practical teaching to realize the organic integration of classroom teaching and social reality. 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	Ideology, Morality and the Rule of Law, Modern Chinese History, Introduction to Xi Jinping's Thought on Socialism with Chinese Characteristics for a New Era.
Module objectives/intended learning outcomes	To realize political identity, national identity and cultural identity through the teaching and learning of the Fundamental Principles of Marxism, and then to help students deeply realize the significance of adhering to and developing socialism with Chinese

	characteristics, and to enhance the "Four Confidences" and the "Four Consciousnesses". "Through the teaching of the Marxism Basic Theory, students are guided to form ideological concepts in line with the core socialist values, and are equipped with the basic ability to identify and analyze real problems.
Content	**Introduction** This chapter corresponds to the course objectives 2, 3 and 4, and corresponds to the Civics indicator points 1, 2 and 4. **1. Teaching content** (1) What is Marxism (2) The emergence and development of Marxism (3) Distinctive features of Marxism (4) Contemporary values of Marxism (5) Conscious study and application of Marxism **Chapter 1: The Materiality of the World and the Laws of Development** This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) The material unity of the world (2) The dialectical unity of subjective initiative and objective regularity. (3) The universality of connection and development (4) The basic laws of connection and development (5) The dialectical unity of matter and consciousness (6) material dialectics is a scientific method of knowledge **Chapter 2: Practice and cognition and their laws of development** This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) The scientific concept of practice and its significance (2) The nature and basic structure of practice (3) The nature and development law of cognition (4) Objectivity, absoluteness and relativity of truth (5) Dialectical unity of truth and value (6) Epistemology and line of thought (7) Realization of positive interaction between theoretical and practical innovation **Chapter 3: The Materiality of the World and the Laws of Development**

	This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) The dialectical relationship between social existence and social consciousness. (2) Basic social contradictions and their laws of motion (3) The formation and development of world history (4) Social progress and human development (5) Civilization and its diversity (6) The driving force of social and historical development (7) The role of the masses and individuals in social history (8) Relationship between masses, classes, political parties and leaders **Chapter 4 The Nature and Laws of Capitalism** This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civic and Political Indicator Points 1, 2, 3 and 4. **1. Teaching content** (1) The basic contradictions of the commodity economy on the basis of private ownership. (2) The labor theory of value and its significance (3) The theory of surplus value and its significance (4) Basic contradictions of capitalism and economic crisis (5) Capitalist political system and its essence (6) Capitalist ideology and its essence. **Chapter 5: The Materiality of the World and the Laws of Development** This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) The formation and characteristics of private monopoly capitalism. (2) Characteristics and essence of state monopoly capitalism (3) Manifestations of economic globalization and its impact (4) Changes in capitalism after the Second World War and their substance (5) New features of the changes in contemporary capitalism (6) Contradictions and conflicts of capitalism in the context of major world changes (7) The historical status of capitalism and its historical inevitability to be replaced by socialism. **Chapter 6: Development and Laws of Socialism**

	This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) The historical progress of socialism over the past 500 years. (2) Basic principles of scientific socialism (3) Basic principles of scientific socialism and socialism with Chinese characteristics (4) The long-term nature of the process of socialist construction (5) Diversity of socialist development paths (6) The vitality of socialism in China **Chapter 7: The High Ideal of Communism and Its Ultimate Realization** This chapter corresponds to course objectives 1, 2 and 3, and corresponds to Civics index points 1, 2, 3 and 4. **1. Teaching content** (1) Methodological principles of foreseeing the future society (2) Basic characteristics of communist society (3) The inevitability of the realization of the communist ideal (4) The long-term nature of the realization of the communist ideal (5) The relationship between the ideal of communism and the common ideal of socialism with Chinese characteristics.
Examination forms	Closed-book written exam
Study and examination requirements	The course of Marxism Basic Theory is a compulsory public foundation course, and the course assessment method includes: usual grade (40%) + result-based assessment (60%) Composition of ordinary grades: attendance (25%) + classroom performance and after-class assignments (25%) + two midterm examinations (50%).
Reading list	[1] Introduction to the Marxism Basic Theory (2021 Edition), the writing group of this book, Higher Education Press; [2] Selected Works of Marx and Engels, People's Publishing House, 2012 edition; [3] Selected Works of Vladimir Lenin, People's Publishing House, 2012 edition; [4] Selected Works of Mao Zedong, People's Publishing House, 1991 edition; [5] Selected Writings of Deng Xiaoping, People's Publishing House, 1993 and 1994 editions; [6] Selected Writings of Jiang Zemin, People's Publishing House,

	206th edition; [7] Selected Writings of Hu Jintao, People's Publishing House, 2016 edition; [8] Xi Jinping on the Governance of the Country, Foreign Languages Press, 2018, 2017, 2020 editions; [9] Xi Jinping, Speech at the Conference Commemorating the 200th Anniversary of the Birth of Marx, People's Publishing House, 2018 edition; [10] Xi Jinping, Speech at the Conference to Celebrate the 100th Anniversary of the Founding of the Communist Party of China, People's Publishing House, 2021 edition.
Data of last amendment	August 2024

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	Li Yaqian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: Undergraduate related majors Type of teaching: Combine classroom lectures with social practice teaching. Teachers use modern scientific and technological means in classroom instruction, such as multimedia and learning platform interactions. Practical teaching involves guiding students in field visits, research, and report writing. 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	Ideology, Morality and the Rule of Law, Marxism Basic Theory, Modern Chinese History
Module objectives/intended learning outcomes	By studying this course, students will understand the main content, historical status, and guiding significance of Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics. Students will learn to apply the positions, viewpoints, and methods of socialism with Chinese characteristics to correctly recognize, analyze, and solve problems encountered in the economic and social development of socialism with Chinese characteristics in the new era, thereby better becoming builders and successors of the cause of socialism with Chinese characteristics in the new era.
Content	**Introduction: The Historical Process and Theoretical Outcomes of**

	the Sinicization of Marxism (2 hours) **1.Course Content** (1) What is Marxism? (2) Why did China choose Marxism? (3) The connotation of the Sinicization and modernization of Marxism (4) The historical process of the Sinicization and modernization of Marxism (5) The theoretical outcomes and their relationships of the Sinicization and modernization of Marxism (6) Requirements and methods for studying this course **Chapter 1: Mao Zedong Thought and Its Historical Status (4 hours)** **1.Course Content** (1) The formation and development of Mao Zedong Thought (2) The main content and living soul of Mao Zedong Thought (3) The historical status of Mao Zedong Thought **Chapter 2: Theory of New Democratic Revolution (6 hours)** **1.Course Content** (1) The national conditions of modern China and the characteristics of the Chinese revolution (2) The practical basis of the theory of new democratic revolution (3) The general line of the new democratic revolution (4) The basic program of the new democracy (5) The road of the new democratic revolution (6) The three major magic weapons of the new democratic revolution (7) The significance of the theory of the new democratic revolution **Chapter 3: Theory of Socialist Transformation (3 hours)** **1.Course Content** (1) New democratic society as a transitional society (2) The Party's general line during the transitional period and its theoretical basis (3) The road of socialist transformation suitable for Chinese characteristics (4) The historical experience of socialist transformation (5) The establishment of the basic socialist system and its theoretical basis

	(6) The great significance of the establishment of the basic socialist system **Chapter 4: Theoretical Achievements of the Preliminary Exploration of the Socialist Construction Road (3 hours)** **1.Course Content** (1) Mobilizing all positive factors to serve the socialist cause (2) Correctly understanding and handling the contradictions in socialist society (3) The idea of following the path of Chinese industrialization (4) Other theoretical achievements of the preliminary exploration (5) The significance of the preliminary exploration (6) The experiences and lessons of the preliminary exploration **Chapter 5: The Formation and Development of the Theoretical System of Socialism with Chinese Characteristics (2 hours)** **1.Course Content** (1) The socio-historical conditions for the formation and development of the theoretical system of socialism with Chinese characteristics (2) The formation of the theoretical system of socialism with Chinese characteristics (3) The cross-century development of the theoretical system of socialism with Chinese characteristics (4) The new development of the theoretical system of socialism with Chinese characteristics in the new stage of the new world (5) The new chapter of the theoretical system of socialism with Chinese characteristics in the new era **Chapter 6: Deng Xiaoping Theory (6 hours)** **1.Course Content** (1) The fundamental and primary question answered by Deng Xiaoping Theory (2) The essence of Deng Xiaoping Theory (3) The main content of Deng Xiaoping Theory (4) The historical status of Deng Xiaoping Theory **Chapter 7: The Important Thought of "Three Represents" (3 hours)** **1.Course Content** (1) The formation conditions of the important thought of "Three Represents" (2) The formation process of the important thought of "Three

	Represents" (3) The core viewpoint of the important thought of "Three Represents" (4) The main content and historical status of the important thought of "Three Represents" **Chapter 8: Scientific Outlook on Development (3 hours)** **1.Course Content** (1) The formation conditions of Scientific Outlook on Development (2) The formation process of Scientific Outlook on Development (3) The scientific connotation of Scientific Outlook on Development (4) The main content and historical status of Scientific Outlook on Development
Examination forms	Closed-book written exam
Study and examination requirements	The course "An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics" is a compulsory public course. The assessment methods include attendance (10%), 5 regular assignments (20%), class performance (10%), and a final exam (60%).
Reading list	**Recommended Textbooks** [1] An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics, 8th Edition, February 2023, Higher Education Press [2] Reference Books and Literature [3] Marx and Engels: Selected Works of Marx and Engels, Volume 1 and Volume 4, 2012, People's Publishing House [4] Lenin: Selected Works of Lenin, Volume 2, 2012, People's Publishing House [5] Mao Zedong: Selected Works of Mao Zedong, Volumes 1-4, 1991, People's Publishing House [6] The Central Documentation Research Office of the CPC: The Complete Works of Mao Zedong, Volumes 1-8, 1999, People's Publishing House [7] Deng Xiaoping: Selected Works of Deng Xiaoping, Volumes 1-3, 1994, People's Publishing House [8] The Central Documentation Research Office of the CPC: The Collected Works of Deng Xiaoping (1949-1974) (Volumes I, II, III),

	2014, People's Publishing House [9] Jiang Zemin: Selected Works of Jiang Zemin, Volumes 1-3, 2006, People's Publishing House [10] The Editing Committee of the Central Documents of the CPC: Selected Works of Hu Jintao, Volumes 1-3, 2016, People's Publishing House [11] (Additional titles omitted for brevity, following the same format as above) **Online Learning Resources** [1] The An Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics resource sharing course on Learning Tong. [2] Xinhuanet: http://www.xinhuanet.com/ [3] People's Daily Online: http://www.people.com.cn/ [4] Learning Power and other online resources: https:// www.xuexi.cn/
Data of last amendment	August 2024

Military Theory

Module designation	Military Theory
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Ma Qianlu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All majors Type of teaching: (1) Elaborate on fundamental concepts and delve deeply into knowledge interpretation. Focus on key content tailored to the characteristics of higher education, coordinate the three-tiered teaching objectives, and integrate value education into the knowledge-based content system. Emphasis is placed on the systematic nature of knowledge, which is the pursuit of the Military Theory shared course. (2) Combine situational analysis with case studies. Nurture the spirit of "every citizen bears responsibility for the rise or fall of the nation" through incisive analysis of China's current surrounding security environment and the dynamics of traditional and non-traditional threats. Cultivate love for the Party and the military by exploring the arduous struggle of the People's Liberation Army and the profound essence of Mao Zedong's military thought. Stimulate enthusiasm for scientific knowledge by understanding the competitive landscape of high-tech weaponry in today's world. (3) Integrate summarization of patterns with forward-thinking reflection. Inspire students to pursue meaningful life goals through the illumination of knowledge rather than hollow rhetoric. Make full use of the online platform to build communication bridges between students, professors, and academic management departments, integrating teaching, learning, research, and assessment into a cohesive whole. (4) Combine systematic video lectures with recommended readings. Illustrate classic theories with iconic battle examples, trace historical development through vivid historical facts, and support rational conclusions with profound analyses of current trends. This perfectly achieves a blend of ideological depth, liveliness, and engaging content, making the course highly

	appealing. Contact hour: 36 hours Including: Online Learning : 36 hours Size of class: 40-60 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	Through the teaching of military theory courses, students are guided to deeply study key knowledge such as national defense history and China's national defense system, accurately grasp the national security situation and challenges, and strengthen national defense awareness and patriotism. Students are trained to use military thinking to analyze war examples, comprehend the characteristics of information warfare, reasonably construct a cognitive framework for modern military, effectively improve strategic thinking and comprehensive national defense quality, and become promising young people with family and country feelings and national defense literacy.
Content	**Chapter 1 International Strategic Environment and National Security** **1.1 Overview of National Security** (1) Basic Connotation of National Security (2) Analysis of the Current National Security Situation in China (3) Reflections on Safeguarding China's National Security **1.2 China's Peripheral Security** (1) Opportunities Facing China's Peripheral Security (2) Challenges and Threats to China's Peripheral Security (3) Sino-US Relations and Sino-Japanese Relations **Chapter 2 China's National Defense** **2.1 Overview of National Defense** (1) Definition of National Defense (2) History of National Defense (3) Defense Policy

	(4) A Prosperous Country Strengthens the Military, and a Strong Military Protects the Country (5) Focusing on Strengthening Patriotism Education (6) Building Elite Forces and Advanced Equipment to Fortify National Defense **2.2 National Defense Laws and Regulations** (1) Characteristics of National Defense Laws and Regulations (2) National Defense Laws and Regulations System (3) Citizens' National Defense Obligations (4) Citizens' National Defense Rights (5) The Relationship between Citizens' National Defense Obligations and Rights **2.3 National Defense Mobilization** (1) Strategic Position of National Defense Mobilization (2) Basic Content of National Defense Mobilization (3) Responsibilities and Obligations of Citizens in National Defense Mobilization **2.4 China's Armed Forces** (1) Overview of China's Armed Forces (2) Composition and Differentiation of China's Armed Forces - The Army (3) Composition and Differentiation of China's Armed Forces - The Navy, Air Force, and Rocket Force (4) Composition and Differentiation of China's Armed Forces - Information Support Force, Military Space Force, Cyberspace Force, Joint Logistics Support Force, and Reserve Forces (5) Composition and Differentiation of China's Armed Forces - The Armed Police Force and the Militia (6) Missions of China's Armed Forces (7) Equipment of China's Armed Forces **Chapter 3 History of Warfare and Military Thought** **3.1 *The Art of War* by Sun Tzu** (1) The Emergence and Major Influence of The Art of War (2) Theoretical Essence of The Art of War (Part I) (3) Theoretical Essence of The Art of War (Part II) **3.2 *On War*** (1) Carl von Clausewitz and His Book On War (2) Main Essence of On War (Part I)

	(3) Main Essence of On War (Part II) **3.3 The New Military Revolution in the World** (1) The Emergence of the New Military Revolution in the World (2) Progress of the New Military Revolution in the World - Formation of Information-Based Weaponry Systems (3) Progress of the New Military Revolution in the World - Comprehensive Renewal of Operational Methods (4) Progress of the New Military Revolution in the World - Continuous Innovation in Military Theories (5) Progress of the New Military Revolution in the World - Profound Changes in Military Organizational Structures (6) Trends of the New Military Revolution in the World **3.4 Information-Based Warfare** (1) Formation and Evolution of Information-Based Warfare (2) Basic Characteristics of Information-Based Warfare (3) Main Operational Styles of Information-Based Warfare (4) Preparing to Win Information-Based Warfare **Chapter 4 Operational Practices and Theoretical Development of the Chinese People's Liberation Army** **4.1 Mao Zedong's Military Thought** (1) Mao Zedong's Great Influence and the Definition of Mao Zedong's Military Thought (2) Theory on Building the People's Army (3) Thought on People's War and Its Strategic and Tactical Principles **4.2 Xi Jinping's Thinking on Strengthening the Military** (1) Establishment and Basis of the Goal of Strengthening the Military in the New Era (2) Scientific Connotation of the Goal of Strengthening the Military in the New Era (Part I) (3) Scientific Connotation of the Goal of Strengthening the Military in the New Era (Part II) **Chapter 5 Information-Age Weaponry and Basic Tactical Applications** **5.1 Development of Naval Weaponry and Its Impact on Operations** (1) New Developments in Aircraft Carriers (2) New Developments in the Combat Capabilities of Surface

	Ships (3) Impact of New Developments in Weaponry on Operational Concepts and Styles **5.2 Information-Based Operational Platforms** (1) Development of Information-Based Operational Platforms - Land Warfare Platforms (2) Development of Information-Based Operational Platforms - Air Warfare Platforms (3) Development of Information-Based Operational Platforms - Naval Warfare Platforms (4) Development of Information-Based Operational Platforms - Space Warfare Platforms (5) Impact of the Development of Information-Based Operational Platforms on Modern Warfare (6) Future Development Trends of Information-Based Platforms
Examination forms	Online Test
Study and examination requirements	Military Theory is mainly assessed through process-based assessment and final exams, according to the course assessment plan. The overall grade for online learning = General Performance (30 points) + Scores of Chapter Test scores (10 points) + Scores for Face-to-face Class (20 points) + final exam (40 points). General Performance = Learning Progress (10 points) + Learning Habit (10 points) + Learning Interaction (10 points). (1) Learning Progress: Students shall obtain full points for learning progress by completing all tutorial videos and chapter tests before the deadline. (2) Learning Habit: Students can obtain daily learning habit points by studying tutorial videos for at least 25 minutes in a single day (a recommended study duration of 25-30 minutes is advised). (3) Learning Interaction: The question-and-answer score is composed of three parts, which are the number of valid questions asked, the number of valid answers given, and the number of valid answers received.
Reading list	[1] Textbook For College Military Education, edited by He Ping, Xu Chuanguang, and Wang Junhui, National University of Defense Technology Press, May 2021.
Data of last	September, 2024

amendment	

Career Development

Module designation	Career Development
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Su Daxun
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
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	1. Starting from the meaning and theme of career development 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** (1) The basic ideas and content structure of this course. (2) The importance of career development to individual life. (3) The steps and process of career development. **Chapter 2: Investigation** **1. Teaching content** (1) Understand the classification of occupations, the relationship between majors and occupations, and the career development path of the majors studied. (2) The basic coordinates of the career map and new trends in career development, (3) Understand the workplace and the world of work; master the methods of obtaining career information. (4) The colorful choices of college students. (Exploration of graduation paths - studying in China, studying abroad, employment, entrepreneurship; exploration of growth resources - campus exploration, family exploration, social resource exploration) **Chapter 3: Self-establishment** **1. Teaching content** (1) Analyze the importance of professional interests, guide students on how to discover and cultivate professional interests, and understand the relationship between interests and career development. (2) Explain the classification of professional personality and the corresponding types of professions, introduce the evaluation methods and improvement means of professional personality. (3) Introduce professional abilities and their classification, and teach methods to explore, develop and improve professional abilities. (4) Explain the definition and significance of professional values, and introduce the evaluation methods and development paths of professional values. **Chapter 4: Investigation II**

	1. Teaching content (1) Introduce the decision-making style and principles of career; analyze the challenges faced by career decision-making, and teach the correct way to deal with challenges. (2) Guide students to make a good transition and connection between academic career and career; master the correct goal setting method, be able to set long-term and short-term goals for their career development and make corresponding action plans. (3) Write a complete career development book based on their own reality. **Chapter 5: Pursuit of Excellence** **1. Teaching content** Analyze the connotation and necessity of professional cultivation; teach the basic meaning and function of self-development; combine cases to guide students to establish and improve career goals and realize their life ideals.
Examination forms	Examination (open-book, closed-book, etc.) or assessment (interview, short essay, etc.)
Study and examination requirements	The course "Career Development" 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. [3] Zhong Gulan and Yang Kai: College Students' Career Development and Planning, East China Normal University Press, 2016, 2nd edition. [4] Yin Fengxia: Professional Ethics and Professional Quality [M]. Beijing: Machinery Industry Press, 2012.4. [5] Mou Degang, "Self-cultivation and Serving the Country - A Reader of Socialist Core Values for College Students" [M]. Zhejiang University Press, 2015.9. [6] Zhao Jian, "Research on the Career Outlook Education of College Students" [M]. Wuhan University Press, 2017.1. [7] Wang Xianfang, Cheng Yanli, "University Career Design and Career Development Planning" [M]. Shanghai Jiaotong University

	Press, 2017.8. [8] Su Chunhai, "University Career Development Reader" [M]. Nanjing: Jiangsu Phoenix Education Press, 2018. [9] Wang Lu, Li Cuiping, Zhu Xiufen, "University Career Development" [M]. Beijing: Higher Education Press, 2018. [10] Gu Xueying, "University Career Development and Employment Guidance" [M]. Nanjing: Nanjing University Press, 2018. [11] Jia Jie, "Live Clearly: Eighteen Typical Career Counseling", Peking University Press, 2015 2016 edition. [12] Classical book: "Tearing Down the Walls in the Mind", Beijing United Publishing Company, 2016 edition.
Data of last amendment	July 2024

Psychological Health Education

Module designation	Psychological Health Education
Semester(s) in which the module is taught	2nd semester
Person responsible for the module	Li Baohui
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All majors Type of teaching: Theory teaching, case study Contact hour: 32 hours Including: Lecture Hours : 16 hours Extracurricular Learning Hours : 16 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	Enhance students' awareness of psychological health. Recognize the importance of psychological health for overall well-being, understand the harm of psychological problems to physical and psychological health, and clearly acknowledge the possibility of their own psychological issues. Cultivate students' good psychological literacy, including self-awareness, emotional management, interpersonal communication skills, etc. Through the course, learn to better cope with various pressures in life and study, maintain an optimistic attitude, establish a healthy lifestyle, and fundamentally prevent the occurrence of psychological problems. Psychological health education is not only about solving current psychological problems, but also about guiding college students to actively pursue psychological health and happiness, and achieve the value of life. Through psychological health education, college students can better enhance their self-esteem and self-confidence, shape a positive life attitude, and achieve

	spiritual growth.
Content	**Chapter 1 Starting from the "Heart"—Overview of College Students' Psychological Health** **1. Teaching Content** (1) Understand psychological health (2) Analysis of common psychological problems among college students (3) Approach to psychological counseling **Chapter 2 Integrating into College—Psychological Adaptation of College Students** **1. Teaching Content** (1) Overview of psychological adaptation (2) Adaptation problems of freshmen (3) Approaches and methods to solve adaptation problems **Chapter 3 Knowing Oneself—Self-Consciousness of College Students** **1. Teaching Content** (1) Overview of self-consciousness (2) Characteristics and common problems in the development of self-consciousness among college students (3) Shaping a sound self-consciousness **Chapter 4 Master of Emotions—Emotional Management for College Students** **1. Teaching Content** (1) Understanding emotions (2) Common emotional disorders among college students (3) Tips for emotional management **Chapter 5 Charisma of Personality—Healthy Personality and Its Shaping for College Students** **1. Teaching Content** (1) Overview of personality (2) Common personality development defects and adjustments among college students (3) Shaping a sound personality **Chapter 6 Breaking Through Adversity—Coping with Stress and Frustration for College Students** **1. Teaching Content** (1) Correct understanding of stress (2) Analysis of stress among college students (3) Improving frustration resistance

	Chapter 7 Wisdom in Social Interaction—Interpersonal Communication of College Students **1. Teaching Content** (1) Overview of interpersonal communication among college students (2) Psychological misunderstandings and adjustments in interpersonal communication of college students (3) Establishing and improving good interpersonal relationships among college students **Chapter 8 Encountering Love—Love and Sexual Psychology of College Students** **1. Teaching Content** (1) Overview of love and sexual psychology (2) Common love and sexual psychological problems among college students (3) Adjustment of healthy love and sexual psychology for college students **Chapter 9 Wise Use of the Internet—Internet Psychology of College Students** **1. Teaching Content** (1) Understanding internet psychology (2) Common internet psychological problems (3) Cultivating healthy internet psychology and behavior **Chapter 10 Beauty of Life—Life Education and Crisis Intervention for College Students** **1. Teaching Content** (1) Overview of life education for college students (2) Psychological crises of college students (3) Psychological crisis intervention
Examination forms	Closed-book written exam
Study and examination requirements	The Psychological Health Education course is a public compulsory course. The assessment methods of the course include: in-class learning discussions and course assignments (30%) + summative assessment (70%).
Reading list	1. Recommended Textbook: *General Psychology*, compiled by Peng Danling, Beijing Normal University Press, 2018. 2. Reference Books and Literatures: [1] *College Students' Psychological Health Education* (3rd Edition), compiled by Fang Xiaoyi, Posts & Telecom Press, 2022.

	[2] *College Students' Psychological Health Education* (3rd Edition), compiled by Zhou Li, Renmin University of China Press, 2020. [3] *College Students' Psychological Health Education* (3rd Edition), compiled by Huang Xiting, East China Normal University Press, 2020. 3. Online Learning Resources: MOOC of China University of Mining and Technology: https://www.icourse163.org/course/CUMT-1466066208?from=searchPage&outVendor=zw_mooc_pcssjg_
Data of last amendment	August 2024

Employment Guidance

Module designation	Employment Guidance
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Su Daxun, Zheng Yao
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
Required and recommended prerequisites for joining the module	Career Development
Module objectives/intended learning outcomes	The course aims to help students analyze and accurately grasp the 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** (1) Analysis of employment situation for college students (2) Analysis of employment environment for college students: Outlook of the career **Chapter 2 Employment Policies and Procedures for College Students** **1.Teaching Contents** (1) Employment policies for college students (2) Types of college students' employment (3) Employment procedures for college students **Chapter 3 Psychological Preparation for College Students' Employment** **1.Teaching Contents** (1) Common Psychological Problems of College Students in the Employment Process. (2) Psychological Adjustment of College Students in the Employment Process. **Chapter 4 Employment Abilities that College Students Should Possess** **1.Teaching Contents** (1) Knowledge Literacy that College Students Should Possess (2) Ability Literacy that College Students Should Possess (3) Cultivation Paths for Improving Employment Abilities of College Students **Chapter 5 Employment Information and Employment Channels** **1.Teaching Contents** (1) Collection of Employment Information (2) Screening of Employment Information (3) Application of Employment Information **Chapter 6 Preparation of Job Search Materials for College Students** **1.Teaching Contents** (1) Basic Composition of Job Search Materials; (2) Make a Beautiful Resume; (3) Prepare Other Job Search Materials. **Chapter 7 Written Tests and Interviews for College Students' Job Search** **1.Teaching Contents** (1) Preparation and Precautions for Written Tests;

	(2) Assessment for Interviews; (3) Common Forms of Interviews; (4) Coping Skills for Interviews. **Chapter 8 Etiquette for College Students in Job Hunting** **1.Teaching Contents** (1) Grooming and Dressing Etiquette; (2) Manners and Social Etiquette. **Chapter 9 Ways of Job Contract Signing for College Students and Precautions** **1.Teaching Contents** (1) Grooming and Dressing Etiquette; (2) Manners in Social Intercourse and Social Etiquette.
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	August 2024

Physical Education

Module designation	Physical Education
Semester(s) in which the module is taught	1st, 2nd, 3rd, and 4th semester
Person responsible for the module	Ding He
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: All professional schools Type of teaching: in class, teaching methods such as explanation, demonstration, decomposition and complete teaching method, comprehensive practice method, circular practice method, repeated practice method, game practice method and competition practice method are mainly adopted. Extracurricular learning is carried out through students' independent practice and teachers' online guidance. Contact hour: 144 hours Including: Lecture Hours : 128 hours Experimental hours : 8 hours Other hours : 8 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 144 hours Contact hours = 144 hours Self-study hours = 0 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	1: to learn the basic theoretical knowledge of sports and practice methods, master the disposal methods of common sports trauma. 2: master the 1-2 sports basic technology, improve sports skills, enhance sports ability, develop lifelong exercise habits. 3: the development of physical flexibility and coordination and endurance, strength, speed and other physical quality. 4: Master and use appropriate methods to regulate self-emotion, and show brave and tenacious will in a challenging sports environment.

	5: cultivate a good spirit of collectivism and patriotism, and establish a correct outlook on life and values.
Content	In order to achieve the goal of physical education curriculum and organically combine classroom teaching with extracurricular and extracurricular sports activities, various types of physical education courses are set up for all students. Students can choose projects according to their own conditions and interests to meet the needs of students of different levels, levels and interests. At present, it mainly offers optional sports courses, sports health care courses, sports classes, special improvement classes and sports clubs. Basically meet the needs of students to choose their own projects, choose teachers and choose time. Course Content: 1. Sports elective courses: In order to benefit the needs of college students' personality development and multiple interests, a variety of sports elective courses are offered to all students, including: basketball, volleyball, air volleyball, football, table tennis, badminton, tennis, peek ball, Baseball and softball, cheerleading, aerobic dance, rhythmic gymnastics, yoga, taekwondo, karate, martial arts, roller skating, track and field, fat reduction and body shaping courses. 2. Physical education and health care courses: For some college students with physical abnormalities, diseases, disabilities, and frailness, physical education and health care courses focusing on rehabilitation, health care, and suitable activities are offered. 3. Special improvement class: set up improvement class by item, complete the training content and undertake the popularization and promotion of the special in the school, and be responsible for the organization, management and referee of the special competition in the school under the guidance of teachers. The teaching plan and assessment criteria for such courses shall be formulated separately. 4. Sports clubs: for some students whose physical fitness level has reached a higher standard, diversified autonomous sports courses are offered. The teaching plan and assessment criteria of the club courses shall be formulated separately. 5. Sports class: adopt the form of multi-person sports to realize the linkage between different special projects, and select the hot

	sports activities to equip special teachers for professional guidance 2-3 times a week. 6. The basic theory of physical education arranges different contents in each semester, uses the online platform for mixed teaching, and requires students to browse and learn within the specified time limit. 7. Each physical education class should ensure proper exercise intensity and arrange at least one physical fitness exercise for 15-30 minutes. 8. Establish good communication channels between teachers and students to guide students' extracurricular physical exercise. 9. Actively adopt various teaching methods such as network, multimedia and audio-video teaching.
Examination forms	Physical measurements
Study and examination requirements	The assessment of physical education curriculum includes the establishment of sports knowledge, the enhancement of sports ability, the improvement of physical quality, the usual performance and the process evaluation of extracurricular physical exercise, etc. Sports results are based on a percentile system.
Reading list	1, "University Sports Health Theory and Practice" Shanghai Jiaotong University Press, September 2022, the first edition of the first printing. 2. Interpretation of National Student Physical Health Standard, People's Education Press, June 2007, Editorial Board of Interpretation of National Student Physical Health Standard
Data of last amendment	August 2024

Understanding Practice

Module designation	Understanding Practice
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Zhou Qian
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 80-120 students
Workload (incl. contact hours, self-study hours)	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2
Required and recommended prerequisites for joining the module	None
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. Understand the basic production flow, equipment and management mode of typical electronic- information enterprises. 2. Know relevant national / industrial standards, IP and EHS regulations. ● **Skill:** 1. Observe systematically, keep technical diaries, collect and organise first- hand data. 2. Compile a structured practice report that links theory with practice. ● **Competence:**

	1. Follow professional ethics and safety rules; collaborate in teams. 2. Reflect on social, cultural and environmental factors when analysing industrial activities.
Content	**Experiment /practice teaching:** 60 hours (16 contact hours; 44 self-study hours) **Stage 1 Attend Briefings** (4 contact hours; 11 self-study hours) ● Understand the rules and regulations of the university and the internship organization. ● Learn the professional norms and important considerations of the internship organization. ● Gain awareness of the technologies, intellectual property, and standard regulations related to the organization's industry. **Stage 2 Organized Visits** (4 contact hours; 11 self-study hours) ● Familiarize yourself with the production equipment and operational processes of the internship organization. ● Understand practical production knowledge and the organizational management structure of the company. **Stage 3 Internship Journal** (4 contact hours; 11 self-study hours) ● Keep a detailed daily record of the internship activities. ● Collect and organize internship materials and reports to prepare for the final internship report. **Stage 4 Internship Summary Report** (4 contact hours; 11 self-study hours) ● Summarize the internship experience, identify areas for improvement, and compile a well-structured final report.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Internship practice accounts for 50%. Internship report accounts for 50%.
Reading list	**Reference books** [1] Wei Xiaohui. Internship Guidebook for Electronic- Information Majors [M]. Science Press, 2016.
Data of last amendment	August 2024

Use of Electronic Measuring Instruments

Module designation	Use of Electronic Measuring Instruments
Semester(s) in which the module is taught	1st semester
Person responsible for the module	Lecturer Yu Miao
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2
Required and recommended prerequisites for joining the module	Experiments for Fundamentals of Circuit Analysis, Experiments for Fundamentals of Digital Electronic Technology, Experiments for Fundamentals of Analogy Electronics 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. Master basic electronic measurement methods, the use of common passive and active components, the operation of typical electronic measurement instruments, and the testing methods of key parameters. 2. Understand the safe operation of commonly used electronic measurement instruments and their key technical specifications. ● Skill:

	1. Be capable of using common electronic measurement instruments and designing appropriate measurement schemes based on the measurement requirements of electronic parameters. 2. Improve familiarity with common electronic measurement instruments and practical hands-on operational skills. ● Competence: 1. Be able to reasonably select and utilize the necessary instruments, tools, simulation software, and information resources for analyzing, calculating, and designing complex engineering problems in electronic information systems. 2. Be able to apply fundamental engineering knowledge to conduct comprehensive comparisons and select measurement instruments to solve electronic information-related problems.
Content	**Experiment /practice teaching** (16 contact hours; 44 self-study hours) **Experiment 1 Use of the Integrated Electronic Experiment Box and Handheld Multimeter** (3 contact hours; 8 self-study hours) ● Learn how to use the ephysical electronic components, such as typical resistors and capacitors. ● Learn how to use the main components of the integrated electronic experiment box, including the power supply section, resistor section, switch section, analog electronics experiments, and digital electronics experiments. ● Learn how to use the handheld multimeter, including measuring resistance, capacitance, and the DC voltage parameters of the experiment box, and comparing the absolute and relative errors with the nominal values. **Experiment 2 Use of the Desktop Multimeter** (3 contact hours; 8 self-study hours) ● Test the functions and experimental operations of the desktop multimeter. ● Use the desktop multimeter to measure DC voltage and resistance parameters, compare them with the nominal values, calculate the absolute and relative errors, and compare the results with those from the handheld multimeter. **Experiment 3: Use of the Signal Generator**

	(3 contact hours; 8 self-study hours) ● Test the functions and experimental operations of the signal generator. Build a circuit that uses a decoder as a data distributor. ● Use the signal generator to produce alternating voltage, and measure the AC voltage at different frequencies, duty cycles, and waveforms using both the handheld multimeter and desktop multimeter, followed by a comparative analysis. **Experiment 4: Use of the Millivoltmeter** (2 contact hours; 6 self-study hours) ● Test the functions and experimental operations of the millivoltmeter. ● Use the millivoltmeter to measure the alternating voltage from the signal generator, and measure the AC voltage at different frequencies, duty cycles, and waveforms using both the desktop multimeter and millivoltmeter, followed by a comparative analysis. **Experiment 5: Use of the Oscilloscope** (2 contact hours; 6 self-study hours) ● Test the functions and experimental operations of the oscilloscope. ● Use the oscilloscope to demonstrate the different waveforms from the signal generator and measure typical waveform parameters such as amplitude, frequency, rise time, peak-to-peak value, and duty cycle, comparing the results with those obtained from the millivoltmeter and multimeter. **Experiment 6: I Comprehensive Measurement of Electronic Component Parameters and Assessment** (3 contact hours; 8 self-study hours) ● perform comprehensive parameter measurements using the handheld multimeter, desktop multimeter, signal generator, millivoltmeter, and oscilloscope. ● Assess the suitability of instruments, experimental operations, and precautions.
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. Classroom performance accounts for 10%, report quality accounts for 10%, and final exams account for 50%.

Reading list	1. Required books [1] Guo Yecai. Practical Course on Electronic Measurement and Instruments [M]. Xi'an: Xi'an University of Electronic Science and Technology Press, 2020. 2. Reference books [1] Wang Yongxi. Fundamentals of Electronic Measurement [M]. Beijing: Beijing University of Posts and Telecommunications Press, 2015. [2] Zhu Yun. Electronic Measurement Technology [M]. Beijing: Tsinghua University Press, 2023. [3] Jin Ming, Zhang Chunyan, Li Jiangxue, and Wang Xuan. Electronic Measurement Technology [M]. Beijing: Higher Education Press, 2021.
Data of last amendment	August 2024

Metalworking Practice II

Module designation	Metalworking Practice II
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Lecturer Cao Haixiao
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 16 hours Including: Theoretical teaching: 0 hours Experiment teaching: 16 hours Computer practice: 0 hours Size of class: 44 students
Workload	Total workload = 60 hours Contact hours = 16 hours Self-study hours = 44 hours
Credit points	2
Required and recommended prerequisites for joining the module	None
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. Understand safety procedures for benchwork, master the use of Personal Protective Equipment (PPE), prevent accidents, and ensure a safe working environment. 2. Identify and proficiently operate various benchwork tools and equipment (e.g., hand vices, bench vices, power clamps, files, hammers) to enhance work efficiency. ● Skill:

	1. Master fundamental benchwork skills (e.g., filing, sawing, marking-out, drilling) to establish a solid foundation for future work. 2. Understand core principles of benchwork processes, including material properties, measurement & marking, cutting practices, and assembly/disassembly techniques, providing theoretical support for complex tasks. ● Competence: 1. Analyze and resolve benchwork problems using acquired knowledge to enhance problem-solving capabilities. 2. Integrate theoretical knowledge with practical application to improve real-world problem-solving skills and prepare for future careers. 3. Collaborate effectively with others to complete tasks, fostering teamwork and communication skills.
Content	Experiment /practice teaching (16 contact hours; 44 self-study hours) Practice 1 Benchwork Theory & Instruction (2 contact hours; 10 self-study hours) ● Understand and adhere to benchwork safety rules and technical regulations. ● Master the fundamental techniques of benchwork operations: filing, sawing, drilling, tapping, threading, marking-out, and scraping. ● Master the correct use of all common benchwork tools and measuring instruments. Practice 2 Cutting the Iron Bar (2 contact hours; 10 self-study hours) ● Demonstrate the ability to cut bar stock using a hacksaw. Practice 3: Hammer Tail Fabrication (2 contact hours; 8 self-study hours) ● Fabricate the hammer tail according to specified drawing dimensions (involves sawing). File all surfaces flat and smooth, finishing with sandpaper for a polished appearance. Practice 4: Hammer Head Fabrication (2 contact hours; 8 self-study hours) ● Fabricate the hammer head according to specified drawing dimensions (involves filing). File all surfaces of the head and

	body flat and smooth, finishing with sandpaper for a polished appearance. Practice 5: Drilling and Threading (2 contact hours; 8 self-study hours) ● Demonstrate the ability to drill holes using a drill press, create internal threads using taps and a tap wrench, create external threads using dies and a die stock, and successfully assemble threaded components. Practice 6: Project Showcase & Assessment (2 contact hours; 8 self-study hours) ● All students participate in the project evaluation session, and results are documented.
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. Assessment Breakdown: In-Class Practical Work Performance (40%): Includes three milestone submissions in report format (incorporating design drawings, practical skill tests, and compliance tests). Summative Assessment (60%): Comprises an on-site presentation/demonstration, functional evaluation of the finished project, and the practical training report.
Reading list	1. Required books [1] Wen Jianping, Li Ping. Metal Processing and Practical Training: Benchwork Practice (2nd ed) [M]. Beijing: Higher Education Press, 2019. 2. Reference books [1] Wang Fu, Dong Bin, et al. Benchwork Practical Training Course [M]. Beijing: China Machine Press, 2021. [2] Ye Wanhong, Wang Juexiang. Benchwork Technology and Practical Training (2nd ed) [M]. Beijing: Higher Education Press, 2023. [3] Wang Enhai. Benchwork Technology (2nd ed) [M]. Beijing: Beijing Institute of Technology Press, 2020.
Data of last amendment	August 2024

PCB and SMT Process Practice

Module designation	PCB and SMT Process Practice
Semester(s) in which the module is taught	3rd semester
Person responsible for the module	Professor Yang Chengdong
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: using lecturing as a primary teaching method, in combination with classroom exercises and discussion Contact hour: 32 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 32 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Fundamentals of Circuit Analysis
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. Understand the working principles and precautions of related PCB and assembly equipment, including PCB milling machines, automatic printers, pick-and-place machines, reflow ovens, and automatic optical inspection equipment. 2. Master the basic knowledge of PCB design, manufacturing, and assembly processes. ● **Skills:** 1. Be able to operate PCB milling machines to produce printed

	circuit boards. 2. Be able to perform manual soldering of through-hole and surface-mount components. 3. Be able to design simple PCB layouts and convert them into Gerber files. ● **Competence:** 1. Have the ability to analyze and solve problems related to PCB design and assembly. 2. Be able to work independently or in a team to complete the design, production, and assembly of electronic systems.
Content	**Experiment /practice teaching:** 120 hours (32 contact hours; 88 self-study hours) **Stage 1: Introduction to PCB Design and Manufacturing** (8 contact hours; 8 self-study hours) ● Introduction to PCB design software (e.g., Altium Designer). ● Basic operations of PCB milling machines. ● Overview of PCB manufacturing processes. **Stage 2: PCB Design and Layout** (16 contact hours; 16 self-study hours) ● Design simple circuit schematics using PCB design software. ● Create component libraries for custom components. ● Layout and routing of PCBs. ● Conversion of PCB designs into Gerber files. **Stage 3: PCB Milling and Fabrication** (24 contact hours; 24 self-study hours) ● Operation of PCB milling machines. ● Fabrication of single-sided and double-sided PCBs. ● Quality control and inspection of milled PCBs. **Stage 4: Soldering Techniques and Assembly** (16 contact hours; 16 self-study hours) ● Manual soldering techniques for through-hole and surface-mount components. ● Soldering practice on breadboards and PCBs. ● Assembly of simple electronic systems. **Stage 5: SMT Process and Equipment** (8 contact hours; 8 self-study hours) ● Introduction to SMT processes and equipment. ● Operation and maintenance of SMT equipment. ● Quality inspection using automatic optical inspection equipment. **Stage 6: Project Implementation and Evaluation**

	(8 contact hours; 8 self-study hours) ● Implementation of a complete PCB design and assembly project. ● Evaluation of project outcomes. ● Presentation and documentation of the project.
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 60%. Project quality accounts for 40%.
Reading list	**1. Required books** [1] Wu Li, Yu Yao, Wu Junjie, Zeng Huiming, Pei Xiaofang. Modern Electronic Process Tutorial [M]. Hefei: Hefei University of Technology Press, 2023. **2. Reference books** [1] Cao Wen. Hardware Circuit Design and Basic Electronic Process (2nd Edition) [M]. Beijing: Electronic Industry Press, 2019. [2] Zhang Jin. Electronic Process Practice Tutorial [M]. Beijing: Electronic Industry Press, 2016.
Data of last amendment	August 2024

Electronic System Synthetic Design

Module designation	Electronic System Synthetic Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Lou Yu
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: using lecturing as a primary teaching method, in combination with classroom exercises and discussion Contact hour: 32 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 32 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Fundamentals of Digital Electronic Technology, Experiments for Fundamentals of Digital Electronic Technology, Fundamentals of Analog Electronic Technology, Experiments for Fundamentals of Analogy Electronics 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. Understand the basic concepts and classifications of electronic systems. 2. Master the general methods and steps of electronic system design. 3. Be familiar with the principles and techniques of analog and digital system design. ● **Skills:** 1. Be able to design and implement analog and digital subsystems

	and circuits. 2. Proficient in using simulation software and electronic instruments for circuit analysis and debugging. 3. Capable of writing design reports in accordance with standards. ● **Competence:** 1. Have the ability to analyze and solve complex engineering problems in electronic system design. 2. Be able to integrate theoretical knowledge with practical skills to complete comprehensive electronic system design projects.
Content	**Experiment /practice teaching:** 120 hours (32 contact hours; 88 self-study hours) **Stage 1: Introduction to Electronic System Design** (2 contact hours; 6 self-study hours) ● Overview of electronic systems. ● Electronic system design process. ● Summary of various electronic system design steps. ● Examples of electronic system design topics. **Stage 2: Analog System Design and Implementation** (6 contact hours; 20 self-study hours) ● Basic units of analog systems. ● Generation, processing, and transformation of analog signals. ● Design of analog subsystems and circuits. **Stage 3: Digital System Design and Implementation** (6 contact hours; 20 self-study hours) ● Overview of digital system design. ● Principles and applications of programmable logic devices. ● Hardware description languages and their applications. ● Design of digital subsystems and circuits. **Stage 4: Comprehensive Electronic System Design and Practice** (6 contact hours; 12 self-study hours) ● Overview of comprehensive electronic system design. ● Analysis of typical electronic system design examples. ● Methods and steps of comprehensive electronic system implementation. ● System debugging and testing. **Stage 5: Practical Experiments** (12 contact hours; 24 self-study hours) ● Voice Amplifier Circuit Design. ● Programmable Amplifier Circuit Design. ● Car Tail Light Circuit Design

	Stage 6: Evaluation and Acceptance (2 contact hours; 6 self-study hours) ● Evaluation of student achievements. ● Acceptance of design reports and experimental data.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. The final grade will be based on classroom participation and attendance (40%), experimental reports (60%).
Reading list	**1. Required books** [1] Zang Chunhua, Shao Jie, and Wei Xiaolong. Comprehensive Electronic System Design and Practice [M]. Beijing: Beijing University of Aeronautics and Astronautics Press, 2009. **2. Reference books** [1] Ni Xue, Jia Yongxing. Electronic System Synthetic Design [M]. Beijing: Mechanical Industry Press, 2023.
Data of last amendment	August 2024

Innovation Practice(1)

Module designation	Innovation Practice(1)
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Wang Nan
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, con-tact hour	Target students: students of Electronic Information Engineering 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 = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology, Signals & Systems I, Microcomputer Principles and Single-Chip Microcomputer 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:** 120hours (32 contact hours; 88 self-study hours) **Stage 1 Basic concepts** (4 contact hours; 11 self-study hours) ● Clarify design tasks. ● Introduce typical examples of creative thinking applications ● Study the specific requirements of Innovation Practice (1). **Stage 2 Topic Selection & Team Formation** (2 contact hours; 5 self-study hours) ● Propose or select instructor-provided design topics ● Form cross-functional teams ● Role-definition sessions **Stage 3 Solution Design & Implementation** (18 contact hours; 50 self-study hours) ● Technical literature review & data consolidation ● Theoretical framework design with simulation validation **Stage 4 Research Paper Composition** (4 contact hours; 11 self-study hours) ● Systematic analysis of simulation data ● Comparative analysis with existing solutions ● Produce innovation report **Stage 5 Progress Presentation** (4 contact hours; 11 self-study hours) ● Create the presentation slides based on research paper ● Prepare Q&A contingency materials ● 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

Electronic Technology Course Design

Module designation	Electronic Technology Course Design
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Lecturer Liu Yu
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, con-tact hour	Target students: students of Electronic Information Engineering 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 = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Fundamentals of Analog Electronic Technology, Experiments for Fundamentals of Analog Electronic Technology, Fundamentals of Digital Electronic Technology, Experiments for Fundamentals of Digital Electronic 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 fundamental principles of digital system design and their practical applications. 2. The component selection criteria and parametric calculations for circuit design 3. The PCB design workflows encompassing routing rules and component placement. ● **Skill:** 1. Be able to analyze operational states of basic circuits. 2. Be able to utilize PCB design software for layout development. 3. Be able to conduct independent circuit board assembly and debugging. 4. Be able to apply theoretical knowledge to practical project

	implementation ● **Competence:** 1. Build foundational knowledge for digital/analog circuit design. 2. Enhance practical problem-solving skills through project-based learning. 3. Integrate theoretical understanding with hands-on implementation.
Content	**Experiment /practice teaching:** 120hours (32 contact hours; 88 self-study hours) **Stage 1 Basic concepts** (8 contact hours; 22 self-study hours) ● Introduce the basic concepts and processes of electronic system design. ● Introduce the classification, functions, and selection of electronic components ● Introduce Introduce the design methods of analog circuit functional modules and digital circuit units. **Stage 2 Additive Counter Design** (8 contact hours; 22 self-study hours) ● Design an addition counter with asynchronous reset and synchronous clock ● Observe and verify the designed addition counting. **Stage 3 FIR Filter Design** (8 contact hours; 22 self-study hours) ● Determine filter specifications ● Design a finite length digital low-pass filter ● Filter sine signals **Stage 4 IIR Filter Design** (8 contact hours; 22 self-study hours) ● Determine filter specifications ● Design an infinite length digital low-pass filter ● Filter sine signals
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 40%. Experimental reports accounts for 60%.
Reading list	**1. Required books** [1] Cao Wen, Jia Pengfei, Yang Chao. Fundamentals of Hardware Circuit Design and Electronic Processes (2nd Edition) - Zero-Basic Electronic Technology Course Design [M]. Beijing: Electronics

	Industry Press, 2019. **2. Reference books** [1] Liu Ming. Comprehensive Design and Practice of Electronic Circuits [M]. Beijing: China Machine Press, 2016. [2] Xie Zimei. Design, Experimentation and Testing of Electronic Circuits [M]. Wuhan: Huazhong University of Science and Technology Press, 2006.
Data of last amendment	August 2024

Virtual Course Design

Module designation	Virtual Course Design
Semester(s) in which the module is taught	5th semester
Person responsible for the module	Professor Zhu Shuo
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: using lecturing as a primary teaching method, in combination with classroom exercises and discussion Contact hour: 32 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 32 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	C Language Programming, Microcomputer Principles and Single-Chip Microcomputer 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. Understand the basic functions and operation interfaces of commonly used virtual instrument software and simulation platforms, and grasp the working principles of virtual instrument technology, including the internal logic and interconnections of key links such as data acquisition, signal processing, and system modeling. Be able to analyze the applicability and advantages of different virtual instrument tools in solving specific engineering problems, and master the operation skills of virtual instrument

	software and professional simulation tools. 2. Master the basic design ideas and methods of graphical language virtual instrument systems, and be proficient in using the LabVIEW development platform, including interface design, programming syntax, data processing, and visualization and other key skills. ● Skills: 1. Be able to independently complete the whole process of virtual instrument design and development, including requirement analysis, system design, algorithm development, hardware interface configuration, and system integration according to actual needs. 2. Have the ability to analyze and explain the experimental results of electronic information equipment and systems, master the methods of data processing and information synthesis, and be able to extract key information from complex data to form reasonable and effective conclusions. ● Competence: 1. Be able to flexibly meet the needs of independence and cooperation in team projects. Understand the importance of team collaboration, and be able to play to one's strengths in the project, solve design problems independently, and promote project progress together. 2. Have the ability to communicate and express effectively on complex engineering problems, be able to write clear and professional reports and manuscripts, accurately reflect technical details and innovation points, and be able to communicate effectively in a diversified background, understand and appropriately respond to instructions and feedback from all parties in interaction.
Content	**Experiment /practice teaching:** 120 hours (32 contact hours; 88 self-study hours) **Stage 1 Introduction to Virtual Instruments and LabVIEW Basics** (6 contact hours; 6 self-study hours) ● Introduce the concept of virtual instruments, including their hardware and software systems, and the advantages of virtual instruments over traditional instruments. ● Provide an overview of the LabVIEW development environment, including its interface, palettes, and basic functions.

	• Teach students how to install and configure LabVIEW on their computers. **Stage 2 Basic Operations in LabVIEW** (6 contact hours; 6 self-study hours) • Teach students how to create, edit, and debug VIs in LabVIEW. • Introduce the concept of subVIs and show students how to create and use them. • Provide hands-on practice for students to create simple VIs and subVIs. **Stage 3 Data Types, Structures, and Program Control in LabVIEW** (8 contact hours; 8 self-study hours) • Introduce the basic data types in LabVIEW, including scalars, arrays, clusters, and strings. • Teach students how to use different program control structures in LabVIEW, such as loops, conditionals, and events. • Provide examples and exercises for students to practice using data types and program control structures in their VIs. **Stage 4 File I/O and Graphs/Charts in LabVIEW** (8 contact hours; 8 self-study hours) • Teach students how to perform file I/O operations in LabVIEW, including reading and writing data to text files, binary files, and spreadsheets. • Introduce the different types of graphs and charts available in LabVIEW and show students how to use them to display data. • Provide hands-on practice for students to create VIs that perform file I/O and display data using graphs and charts. **Stage 5 Comprehensive Design Project** (12 contact hours; 12 self-study hours) • Assign a comprehensive design project to students, where they will apply the knowledge and skills they have learned throughout the course to design and develop a virtual instrument system for a specific application. • Provide guidance and support to students as they work on their projects, including regular check-ins and feedback. • Have students present their final projects and evaluate their work based on the course objectives and learning outcomes.

Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Class performance and attendance: 40% Course report: 60%
Reading list	**1. Required books** [1] Guo Yecai. Virtual Instrument Design [M]. Hefei: Hefei University of Technology Press, 2023. **2. Reference books** [1] Chen Xihui. LabVIEW 8.20 Programming from Beginner to Master [M]. Beijing: Tsinghua University Press, 2007. [2] Huang Songling. Virtual Instrument Design [M]. Beijing: Tsinghua University Press, 2015.
Data of last amendment	August 2024

Intelligent Information Processing Synthetic Design

Module designation	Intelligent Information Processing Synthetic Design
Semester(s) in which the module is taught	6th semester
Person responsible for the module	Lecturer Li Yunpeng
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 0 hours Experiment teaching: 32 hours Computer practice: 0 hours Size of class: 40-60 students
Workload	Total workload = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4.0
Required and recommended prerequisites for joining the module	Advanced Mathematics I, Signals & Systems I, Probability Theory and Statistics, Linear Algebra
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. Gain an understanding of the concepts and applications of artificial intelligence and a comprehensive overview of intelligent information processing methods. 2. Master the fundamental theory and applications of rough sets, and comprehend their practical uses. ● Skill: 1. Acquire knowledge of the basic and improved algorithms of

	genetic algorithms, and understand their applications. 2. Master the models and algorithms of information fusion, and understand their applications. ● Competence: 1. Understand the negative selection algorithm and the artificial immune system model. 2. Become familiar with the applications of artificial immune systems in computer security.
Content	**Experiment /practice teaching** (32 contact hours; 88 self-study hours) **Stage 1 Basic Python Programming Experiment** (6 contact hours; 20 self-study hours) ● Install Python 2.7 and the numpy package. ● Pay attention to the differences compared to C++ and Java languages. **Stage 2 k-Nearest Neighbors Algorithm and Decision Tree Algorithm Experiment** (6 contact hours; 20 self-study hours) ● Understand the syntax and usage of Python statements through two k-Nearest Neighbors algorithm examples: "Improving Matchmaking on a Dating Website" and "Handwritten Digit Recognition System." ● Understand the syntax and usage of Python statements through two Decision Tree algorithm examples: "Marine Species Classification" and "Predicting Contact Lens Types." ● Each person will independently design an application example using the k-Nearest Neighbors algorithm. **Stage 3: Naive Bayes Algorithm and Logistic Regression Algorithm Experiment** (8 contact hours; 20 self-study hours) ● Using the textbook example, apply the Naive Bayes algorithm to filter spam emails. ● Vary the number of training and testing datasets in the Naive Bayes algorithm and observe the resulting changes. ● Understand the "Non-Stochastic Gradient Ascent" and "Stochastic Gradient Ascent" Logistic Regression algorithms from the textbook. Use the textbook dataset for training and plot the results.

	● Apply the “Stochastic Gradient Ascent” Logistic Regression algorithm and test it with different iteration counts. **Stage 4: Support Vector Machine Algorithm and AdaBoost Meta-Algorithm Experiment** (12 contact hours; 28 self-study hours) ● Understand the textbook example and apply a simplified version of the SMO algorithm to process small-scale datasets. ● Vary the constants C and maxIter, observe the resulting changes, and provide analysis. ● Use the complete version of the SMO algorithm from the textbook and compare it with the simplified version. ● Understand the AdaBoost meta-algorithm example from the textbook. Use the textbook dataset for training
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. Classroom performance accounts for 15%, report quality accounts for 25%, and final exams account for 60%.
Reading list	1. Required books [1] Yang Qiang. Introduction to Explainable Artificial Intelligence [M]. Beijing: Electronic Industry Press, 2022. 2. Reference books [1] Gao Jun. Introduction to Intelligent Information Processing Methods [M]. Beijing: Machinery Industry Press, 20104 [2] Yan Pingfan and Zhang Changshui. Artificial Neural Networks and Simulated Evolutionary Computation [M]. Beijing: Tsinghua University Press, 2000. [3] Wang Wansen. Principles and Applications of Artificial Intelligence [M]. Beijing: Electronic Industry Press, 2000.
Data of last amendment	August 2024

Innovation Practice(2)

Module designation	Innovation Practice(2)
Semester(s) in which the module is taught	7th semester
Person responsible for the module	Lecturer Li Yunpeng
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: experiment teaching Contact hour: 32 hours Including: Theoretical teaching: 0 hours Experiment teaching: 32 hours Computer practice: 0 hours Size of class: 80-120 students
Workload (incl. contact hours, self-study hours)	Total workload = 120 hours Contact hours = 32 hours Self-study hours = 88 hours
Credit points	4
Required and recommended prerequisites for joining the module	Microcomputer Principles and Single-Chip Microcomputer Technology, Electronic Design Automation, Innovation Practice(1)
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. Students are familiar with cutting-edge AI/IoT standards, policies, and intellectual property rights (IPR). 2. Understand full hardware/software co- design flow and technical writing norms. ● **Skill:** 1. Design a functional electronic product that meets given specs. 2. Use soldering tools, test instruments and EDA software proficiently. 3. Draft a scientific paper and a preliminary patent. ● **Competence:**

	1. Work effectively in an interdisciplinary team, communicate results, respect legal/ethical constraints. 2. Analyse, evaluate and improve complex electronic systems under realistic economic and managerial constraints.
Content	**Experiment /practice teaching:** 120 hours (32 contact hours; 88 self-study hours) **Stage 1 System Realisation** (22 contact hours; 60 self-study hours) ● Master basic soldering techniques and the use of instruments and equipment. ● Learn to perform integrated software and hardware debugging of physical circuits. ● Design and build a comprehensive electronic system that meets specified functional requirements. **Stage 2 Final Course Paper Writing** (6 contact hours; 17 self-study hours) ● Summarize the outcomes of the Innovation Practice training course. ● Follow academic formatting guidelines. ● Learn how to write a scientific and technical paper. **Stage 3 Final Course Presentation** (4 contact hours; 11 self-study hours) ● The presentation should be based on the design and development process, as well as the written course report. ● Prepare a PowerPoint presentation and complete a comprehensive summary report for the innovation course.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Regular performance accounts for 40%, including course participation (15%) and experiments (25%). The final experimental report accounts for 60%.
Reading list	**Reference books** [1] Gao Jixiang. Electronic Technology Experiments and Course Design [M]. Publishing House of Electronics Industry, 2002. [2] Huang Zhiwei. Electronic System Design [M]. Publishing House of Electronics Industry, 2005. [3] Hu Renjie. Outstanding Design Reports of the National College Electronic Design Contest [M]. Southeast University Press, 2018.
Data of last amendment	August 2024

Graduation Practice

Module designation	Graduation Practice
Semester(s) in which the module is taught	8th semester
Person responsible for the module	Lecturer Li Shiyu
Language	Chinese
Relation to curriculum	Compulsory
Teaching methods	Target students: students of Electronic Information Engineering Type of teaching: experimental teaching Contact hour: 64 hours Including: Theoretical teaching: 0 hours Experiment teaching: 64 hours Computer practice: 0 hours Size of class: 40-60 students
Workload (incl. contact hours, self-study hours)	Total workload = 240 hours Contact hours = 64 hours Self-study hours = 176 hours
Credit points	8.0
Required and recommended prerequisites for joining the module	Specialized main courses and specialized elective courses of Electronic Information Engineering.
Module objectives/ intended learning outcomes	Learning outcomes: ● **Course Objective 1:** Through the internship, students are expected to acquire the ability to consider social, health, safety, legal, cultural and environmental constraints in design practice, and to gain a certain understanding of the culture, background and operation of the internship company. During the internship, students are required to deeply understand and apply the relevant knowledge to specific projects to ensure that the design solutions not only comply with professional standards, but also take into account the social responsibility and sustainable development goals, and to enhance their problem-solving ability and professionalism, laying a solid foundation for their future careers. ● **Course Objective 2:** To acquire the basic skills of engineers and a sense of public social responsibility, and to clarify the role of engineers in the

	organization, and their responsibilities. To develop students' ability to work in multidisciplinary teams, to have a deep understanding of team composition and the roles and responsibilities of team members, and to master interdisciplinary communication and cooperation skills. During the internship, students are expected to be able to take the initiative to establish effective communication with members of other disciplines, to solve problems together, to promote team harmony and efficient operation, and to lay a solid foundation for interdisciplinary cooperation in their future careers. ● **Course Objective 3:** Able to simulate problems and also debugging of physical objects with comprehensive consideration of economic and engineering management. They should master the principles of engineering management, economic decision-making methods and relevant national and industrial standard systems in the field of electronics and information, familiarize themselves with intellectual property protection and industrial policies, and have a deep understanding of relevant laws and regulations. During the internship, students need to be able to analyze the impact of different social and cultural factors on the development and application of AI technology, improve their comprehensive decision-making ability, and lay a solid foundation for standardized operation and cross-cultural cooperation in their careers.
Content	**Experimental teaching** (64 contact hours; 176 self-study hours) In order to help students to improve their practical skills, the following five typical experimental classes will be arranged: 1. Study the “Regulations on the Management of Graduation Internship” of the college or organization. (4 contact hours; 12 self-study hours) 2. Understand the management system, organization and operation mechanism of the internship unit. (4 contact hours; 12 self-study hours) 3. Participate in and familiarize with the research, design, application, development and manufacturing of electronic equipment and systems. (36 contact hours; 92 self-study hours) 4. Participate in the production, management, planning, marketing and other specific jobs arranged by the internship organization. (16 contact hours; 48 self-study hours) 5. Write internship reports and summarize reports. (4 contact hours; 12 self-study hours)

Examination forms	Report
Study and examination requirements	No late arrivals, no early departures, and no unauthorized absences. Usual performance accounts for 50%. Report accounts for 50%.
Reading list	**1. Required books** None. 2. **Reference books** [1] Wei Xiaohui. Internship Guidelines for Electronics and Information Technology Students [M]. Beijing: Science Press, 2016.
Data of last amendment	August 2024

Labor Education

Module designation	Labor Education
Semester(s) in which the module is taught	1st, 3rd, 5th and 7th semester
Person responsible for the module	Professor Gu Jing
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: using lecturing as a primary teaching method, in combination with case analysis, practical training and experience, and flipped classroom. Contact hour: 8 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 8 hours Computer practice: 0 hour Size of class: 40-60 students
Workload	Total workload = 60 hours Contact hours = 8 hours Self-study hours = 52 hours
Credit points	2.0
Required and recommended prerequisites for joining the module	None
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 labor science knowledge and improve labor literacy. Be able to understand the basic knowledge of the labor discipline system comprehensively and systematically from the dimensions of the basic concept of the labor view, the theory and practice of labor education in colleges and universities, labor culture, labor practice, career choice and professional ethics, labor remuneration, labor relations and labor rights protection, labor

	evaluation, and the future of labor. ● **Skills**: Be able to use common labor tools correctly, enhance physical strength, intelligence, and creativity, and possess the design and operational capabilities as well as teamwork skills required to complete certain labor tasks. ● **Competence**: Students in labor practice courses should master basic labor knowledge and skills, including the use of common tools and safety protocols. They need to enhance physical strength, intelligence, and creativity, and be able to design and execute labor tasks effectively. Teamwork is essential, requiring strong communication and collaboration skills. Ethical conduct and an appreciation for the value of labor are also important. Students must reflect on their performance and continuously seek improvement. These competencies will prepare them for successful participation in labor practice courses and future labor-related activities.
Content	**Experiment /practice teaching:** 60 hours (8 contact hours; 52 self-study hours) **Stage 1 Daily Life Labor Practice** (2 contact hours; 15 self-study hours) ● Strengthen students' daily life labor education with "service-oriented education" as the carrier, and set up a Labor Week. ● Combining campus life, organize students to carry out on-campus labor skill training and labor exercises such as greening maintenance, campus sanitation, classroom cleaning, laboratory maintenance, labor skill competitions, and display of labor achievements on the premise of ensuring labor safety. **Stage 2 Service-Oriented Labor Practice** (3 contact hours; 15 self-study hours) ● Offer "menu-style" volunteer labor projects to enhance students' awareness of public welfare labor. ● Actively build volunteer service platforms and organize students to participate in off-campus volunteer services in urban and rural communities, welfare homes, and public places. Carry out labor practices such as sanitation services,

	disability assistance services, poverty alleviation services, community convenience services, cultural promotion services, legal popularization services, teaching support services, and policy publicity. **Stage 3 Production Labor Practice** (3 contact hours; 22 self-study hours) ● Carry out production labor practice concurrently with professional practice and entrepreneurial practice. Secondary colleges should make teaching arrangements in accordance with the requirements of professional ability and quality, as well as career development needs. ● Carry out the application and construction of labor practice project libraries for all majors, and organize students to engage in production labor practice in an orderly manner according to different levels and categories.
Study and examination requirements and forms examination	After-class assignment shall be done independently by students after each class. Class performance and attendance: 40% Course report: 60%
Reading list	**1. Required books** [1] Ding Xiaochang. Labor Education for College Students [M]. Shanghai: Shanghai Jiao Tong University Press, 2024.
Data of last amendment	August 2024

Graduation Dissertation(Design)

Module designation	Graduation Dissertation(Design)
Semester(s) in which the module is taught	7th and 8th semester
Person responsible for the module	Professor Gu Jing
Language	Chinese
Relation to curriculum	Compulsory
Type of teaching, contact hour	Target students: students of Electronic Information Engineering Type of teaching: mainly using case teaching, practice teaching, and inquiry-based teaching methods Contact hour: 240 hours Including: Theoretical teaching: 0 hours Experiment /practice teaching: 240hours Computer practice: 0 hour Size of class: 8-10 students
Workload	Total workload = 840 hours Contact hours = 240hours Self-study hours = 600 hours
Credit points	28.0
Required and recommended prerequisites for joining the module	C Language Programming II, Innovation Practice (2)
Requirements according to the examination regulations	Complete all theoretical courses and practical courses
Module objectives/intended learning outcomes	Learning outcomes: ● **Knowledge:** 1. Be able to identify the research direction of graduation design (thesis) related to communication systems (not limited to communication) through literature reading and data collection, propose the expected results of the research topic, and summarize the research route and advanced technical solutions to complete the thesis proposal. 2. Understand the basic principles and methods of the electronic information field and be able to analyze the influencing factors in

	the engineering activity process of the electronic information field through literature research to obtain effective conclusions. ● **Skills:** 1. Be able to analyze and interpret the experimental data and results in the graduation design (thesis), compare them with the expected results in the thesis proposal, determine whether the graduation design requirements are met, analyze the deviations of data or results, and form a written report. 2. Master the use of professional instruments, tools, or software to achieve the purpose of graduation design (thesis), establish models or experimental schemes for the research topic, and test their stability, effectiveness, and limitations. ● **Competence:** 1. Be able to manually draw process figures, processing schematic figures, and machine tool contact size figures. 2. Have the preliminary ability to design metal cutting machines.
Content	**Experiment /practice teaching:** 840 hours (240 contact hours; 600 self-study hours) **Stage 1 Topic Selection** (16 contact hours; 48 self-study hours) ● Mainly by the instructors, according to the characteristics of this major, combined with their own research directions and the topics they host, propose topics and write clear task books. ● Require one topic per student, the topics come from engineering applications and scientific research, with certain theoretical research value or engineering application value, and the difficulty and workload of the topics are appropriate; the proportion of engineering design topics is not less than 40%. ● After students receive the task book, they should first familiarize themselves with the topic, clarify the design requirements, objectives, and significance, collect relevant materials, and understand the relevant situation in combination with reality. **Stage 2 Thesis Proposal** (44 contact hours; 132 self-study hours) ● Through consulting and reading domestic and foreign literature related to the design content, review and analyze the current research status at home and abroad, elaborate on the development trend and existing shortcomings, etc.

	● Understand and propose their own ideas and solutions to solve the problem, determine the research or design content and implementation plan under the guidance of the instructor, and make a work schedule. ● Conduct a feasibility analysis of the plan in an all-round way, considering factors such as economy, environment, law, safety, and health, to optimize and design the research plan. **Stage 3 Implementation, Experimentation, and Data Analysis** (96 contact hours; 236 self-study hours) ● Implement the thesis proposal according to the plan and schedule. ● Timely process experimental data, use the basic theoretical knowledge of this major to explain experimental phenomena, and draw reasonable experimental conclusions. If necessary, adjust the experimental plan according to the experimental results. ● The instructor should guide and check students to complete the design task on schedule, with no less than 2 times per week. **Stage 4 Thesis Writing** (48 contact hours; 144 self-study hours) ● Before writing the thesis formally, first clarify the ideas, write an outline, and submit it to the instructor for modification. ● When writing, the content should strive to be innovative, accurate, objective, practical, and readable. The text should be concise, the thesis structure should be rigorous, and the logic should be tight. ● After the initial draft of the thesis is handed over to the instructor for review, it should be further supplemented, deleted, adjusted, and transformed according to the instructor's opinions. ● The word count of the graduation thesis should be no less than 15,000 words, and the format should comply with the college's undergraduate thesis (design) specifications. ● According to the school's arrangement, conduct a plagiarism check on the thesis (design). For theses that do not meet the requirements of the plagiarism check, the school's regulations will be strictly followed to postpone the defense. **Stage 5 Thesis Defense** (20 contact hours; 40 self-study hours) ● Do a good job in the defense preparation work, such as

	thesis defense application, PPT writing, pre-defense, etc. ● The graduation thesis defense consists of self-narration, questioning and answering, and grade assessment. The defense time for each student is generally about 30 minutes, of which 10 minutes are for the student to briefly report the design content, and the questioning and answering time is 10-15 minutes. The defense group secretary will record the defense situation. ● After the defense, students should modify the thesis again according to the opinions of the defense committee teachers and submit all thesis materials on schedule.
Study and examination requirements and forms examination	Final score include: Advisor Evaluation (30%), review teacher evaluation (30%), defence group evaluation (40%).
Reading list	**1. Required books** [1] "Undergraduate Graduation Thesis (Design) Management Measures of Nanjing University of Information Science and Technology" [2] "Implementation Rules for Undergraduate Graduation Thesis (Design) of Nanjing University of Information Science and Technology"
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