

Wuxi University



無錫學院
WUXI UNIVERSITY

Cultivation Plan of Electrical Engineering and
Automation

Department of Electrical Engineering and Automation
School of Automation

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Cultivation Plan of Electrical Engineering and Automation

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I. Objectives of the Programme

The programme of Electrical Engineering and Automation adheres to the fundamental task of moral education, adapts to the needs of regional economic and social development. Moreover, this major is committed to cultivating innovative engineering and technical talents who possess a strong sense of social responsibility and high comprehensive literacy, all-around development of moral, intellectual, physical, aesthetic and labor education, and solid theoretical foundation and professional skills.

After four years of study, students will first gain a solid foundation in mathematics and science, as well as develop good humanistic literacy and communication skills. Second, students will systematically master the professional knowledge in the fields of new energy power generation, intelligent micro-grid and intelligent manufacturing, and have the ability to discover, analyze and solve complex engineering problems. Third, students will also have engineering application and management skills in energy, electronics, communications, industry and transportation, as well as a broad international perspective and a sense of lifelong learning. Finally, students will be able to work both independently and cooperatively within a team, and be able to organize and coordinate team members to achieve goals.

II. Program Learning outcomes (knowledge, skill and competence)

The learning outcomes of the programme are categorized into the following five components:

a. Basic Science Literacy

- Understanding and applying mathematical and natural science knowledge to analyze practical problems in the field of electrical engineering, which is the basis of professional competence.
- Be able to use computers and the Internet, and have the ability to access and utilize information.
- Having a sense of lifelong learning and be able to pay attention to the development trend and application prospect of science and technology.

b. Professional research ability

- The ability to acquire and digest relevant expertise in the field of electrical engineering and to conduct independent research leading to higher degrees.
- Ability to integrate, synthesize and innovate with specialized knowledge.

c. Engineering application ability

- Be able to skillfully use modern tools to engage in the research, design, development and manufacturing of components, equipment and systems in the fields of new energy power generation and intelligent micro-grid, intelligent manufacturing and high-end electrical equipment.

- Possessing comprehensive qualities in software programming, model building, system debugging and maintenance.
 - Be able to track the frontier technology in the field of electrical engineering, observe the problems existing in specific engineering projects, and gradually improve the application ability while solving problems.
- d. Comprehensive quality
- Having good humanities and social science literacy and engineering professional ethics, and be able to maintain public health and safety in engineering practice.
 - Ability to effectively coordinate and scientifically deal with problems related to engineering practice and social and environmental sustainable development.
 - Lifelong pride in serving socialist construction, learning for pleasure, and have a broad international vision, continuous progress, active dedication, and can strive to promote product innovation and upgrading.
- e. Professional quality
- Good teamwork and communication skills to play an active role in a team.
 - Continuous improvement, able to engage in system analysis, design, development, manufacturing, integration, operation and management in the fields of new energy power generation and smart micro-grid, smart manufacturing and high-end electrical equipment.
 - Having the professional quality of technical backbone in the industry.

III. Models

Module 1: Mathematics and Physics

- Learning objective: To master the relevant knowledge of mathematics, physics and natural science, and to lay a solid foundation for subsequent courses. The ability to apply basic knowledge to analyze and solve practical problems.
- Learning outcomes: Ability to use knowledge of mathematics, physics and natural sciences to understand and express technical problems; Ability to construct basic models to analyze and solve practical problems in engineering; The ability to observe, analyze and solve practical engineering problems using mathematical methods; Ability to analyze, calculate and synthesize phenomena in engineering sciences based on mathematical, physical and natural science knowledge.
- Related courses: Advanced Mathematics I (1), Advanced Mathematics I (2), Linear Algebra, Probability Theory and Statistics, Complex Function Theory and Integral Transforms, College Physics II (1), College Physics II (2), College Physics Experiment II.

Module 2: Engineering Fundamentals

- Learning objective: To master the basic professional knowledge and lay a solid foundation for the study of professional courses.
- Learning results: Master the basic knowledge of electronics, engineering drawing, electrical engineering, control engineering, etc. Ability to analyze and solve practical engineering problems.

- Related courses: Major Introduction, Principle and Application of PLC, Sensor and Detection Technology, New Energy Generation and Inverter Technology, AC and DC Speed Regulation System, Power System Modeling and Simulation, Power Supply and Distribution Technology, .

Module 3: Engineering Applications

- Learning objective: to master solid professional knowledge, and have a strong ability to use professional knowledge.
- Learning outcomes: Mastering the general methods and skills needed to solve practical engineering problems; Continuous analysis, summary and inspection of phenomena in engineering according to the characteristics of electrical engineering.
- Related courses: Engineering Drawing, Circuit Theory, Fundamentals of Analog Electronics, Fundamentals of Digital Electronics, Digital Electronics Experiments, Signals and Systems, Microcomputer Principle and Micro-controller Technology, Microcomputer Principle and Micro-controller Experiment, Automatic Control Theory, Electromagnetic Field in Engineering, Fundamentals of Electrical Engineering, Motor and Drive System, Power Electronics, Power System Analysis, Power System Relaying Protection.

Module 4: Elective Courses

- Learning objective: According to students' course interests and career development needs, meet the personalized learning needs, further expand students' professional knowledge and improve students' knowledge application level.
- Learning outcomes: master multi-disciplinary and multi-dimensional knowledge, and have the skills of interdisciplinary integration required for career development.
- Related courses: Fundamentals of Mechanical Design, Artificial Intelligence, Energy Storage Technology and Application, Engineering Ethics, Engineering Economics, Engineering Project Management, Engineering Creation, Fundamentals of Information and Communication Network.

Module 5: Foreign Languages

- Learning objective: To have intercultural communication skills and international cooperation skills.
- Learning outcomes: Knowledge required to pass the College English Test Level 4 (CET-4). Able to find and read professional English literature, and able to communicate professional questions in English. Have cross-cultural communication skills necessary for career development.
- Related courses: General English (1), General English (2), General English (3), and General English (4).

Module 6: General Courses

- Learning objective: To understand the Chinese social model and social norms. Have good quality, team spirit and humanistic feelings. To achieve the all-round development of morality, intelligence, physical, aesthetic and labor education.
- Learning outcomes: Understand social phenomena, pay attention to and adapt to social development. Communicate and cooperate effectively with others. Be a team player, promote physical and Psychological Health and self-improvement, and have a sound personality and psychological quality. To establish correct outlook on life, values, Ideology, Morality and the Rule of Laws; And possess humanistic quality and social responsibility.
- Related courses: Situation and Policy, Ideology Morality and Rule of Law, Modern Chinese History, Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Marxism Basic Theory, Introduction to Mao Zedong Thought and Theory of Socialism with Chinese Characteristics, C Language Programming, Psychological Health Education, Career Development, Employment Guidance, Innovation and Entrepreneurship Foundation, Physical Education, Military Theory, Social Practice, and Labor Studies for College Students.

Module 7: Practical Courses

- Learning objective: To enable students to consolidate theoretical knowledge, deepen understanding of applied knowledge, and be able to analyze and evaluate complex engineering problems and propose solutions.
- Learning outcomes: Mastering the ability to analyze and solve practical problems in electrical engineering. Master the basic methods and techniques of engineering design and process development, and understand the various factors that affect the technical scheme. Have the ability to apply engineering knowledge to analyze and evaluate problems and understand their limitations. And the ability to design innovatively and find valuable solutions.
- Related courses: Cognitive Practice, Metalworking Practice, Electrical and Electronic Practice, Academic Writing, Power Electronics Comprehensive Practice, Motor and Drive Comprehensive Practice, Power System Relaying Protection Comprehensive Experiment, Electrical Engineering Comprehensive Design, Graduation Practice, PLC Application Innovation Design, AC and DC Speed Regulation Comprehensive Design, Micro-controller Application Design, New Energy Generation and Application Comprehensive Design, Low Voltage Power Distribution Comprehensive Design, Energy Storage Technology and Application Comprehensive Design, Winding Wire Design and Processing Test, Power Quality Design and Test, Innovation and Entrepreneurship Practice, etc.

Module 8: Bachelor's Thesis

- Learning objective: To be able to propose solutions and complete practical projects on the basis of analyzing practical problems.
- Learning achievement: Able to complete the writing of the Bachelor's Thesis with the help of the instructor, and pass the graduation defense.

- Related courses: Graduation Design (Dissertation).

IV. Curriculum structure system

The study of Electrical Engineering and Automation lasts 4 years. According to the teaching plan, the curriculum system is divided into eight modules. The courses of different modules are linked to each other in chronological order.

Courses in the Mathematics and Physics module are offered in semesters 1 to 2 to prepare students for subsequent courses.

Engineering Fundamentals Module courses are offered in semesters 1 to 4 to prepare students for engineering application courses.

Courses in the Engineering Applications Module are offered in semesters 5 to 8 so that students can acquire solid professional knowledge and be able to apply that knowledge effectively.

Courses of Elective Courses module are offered in semesters 1 to 8, based on students' course interests and career development needs to meet personalized learning needs, further expand students' professional knowledge and improve students' knowledge application ability.

Courses in Foreign Languages module are offered in semesters 1 to 4 to enable students to communicate professional issues in English and to develop intercultural communication skills required for career development.

Courses in the General Courses module, offered in semesters 1 to 8, are designed to provide students with a broad knowledge base and interdisciplinary vision, develop critical thinking skills and the ability to apply knowledge comprehensively, so that they can better cope with complex social challenges and professional environments.

The Practical Courses module is offered in semesters 1 to 8. The undergraduate graduation project (thesis) is carried out in the last semester, and the topics are mainly from the scientific research projects of the instructor and practical technical problems of the cooperative enterprises.

According to the cultivation plan, after eight semesters of study, students will receive 206 credits.

V. Bachelor's degree

Students who have completed all the courses required by the program and obtained the required credits, and have obtained the certificate of Level II or above in the National Computer Rank Examination, can obtain a Bachelor of Engineering degree.

VI. Curriculum of the Programme

Curriculum of Electrical Engineering and Automation								
(Note: CP: Credit Point, S: Semester, L - Lecture, P - Practice)		Type	Chinese CP	ECTS CP	Work load		Semester	Remark
Competence fields	Module				Contact Hours	Self-study Hours		
Mathematics and	Advanced	L	6	6	96	84	1	

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Physics	Mathematics I(1)						
	Advanced Mathematics I(2)	L	6	6	96	84	2
	Linear Algebra	L	3	3	48	42	2
	Probability Theory and Statistics	L	3	3	48	42	3
	Complex Function and Integral Transformation	L	2	2	32	28	3
	College Physics II(1)	L	3	3	48	42	2
	College Physics II(2)	L	3	3	48	42	3
	College Physics Experiment II	P	1.5	3	48	42	3
Engineering Fundamentals	Major Introduction	L	1	1	16	14	1
	Principle and Application of PLC	L&P	2	2	32	28	1
	Sensor and Detection Technology	L&P	2	2	32	28	2
	New Energy Generation and Inverter Technology	L&P	3	3	48	42	4
	Ac and DC Speed Regulation System	L&P	3.5	3.5	56	49	4
	Power System Modeling and Simulation	L&P	1	1	16	14	4
	Power Supply and Distribution Technology	L&P	2	2	32	28	6
Engineering Applications	Engineering Drawing	L&P	2	2	32	28	1
	Circuit Theory	L&P	4	4	64	56	2
	Fundamentals of Analog Electronics	L&P	4	4	64	56	3
	Fundamentals of Digital Electronics	L	2	2	32	28	3
	Digital Electronics Experiments	P	1	1	16	14	3
	Signals and Systems	L&P	4	4	64	56	4
	Microcomputer Principle and Micro-controller	L	3	3	48	42	4

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	Technology							
	Microcomputer Principle and Micro-controller Experiments	P	1	1	16	14	4	
	Automatic Control Theory	L&P	3.5	3.5	56	49	4	
	Electromagnetic Fields in Engineering	L	2	2	32	28	3	
	Fundamentals of Electrical Engineering	L	2	2	32	28	4	
	Motor and Drive System	L&P	3	3	48	42	4	
	Power Electronics	L&P	3	3	48	42	5	
	Power System Analysis	L	3	3	48	42	5	
	Power System Relaying Protection	L&P	2	2	32	28	6	
Elective Courses	Fundamentals of Mechanical Design	L	2	2	32	28	3	Require ECTS 8 credits
	Artificial Intelligence	L&P	2	2	32	28	5	
	Energy Storage Technology and Application	L&P	2	2	32	28	6	
	Engineering Ethics	L	1	1	16	14	3	
	Engineering Economics	L	1	1	16	14	3	
	Engineering Project Management	L	1	1	16	14	3	
	Engineering Creativity	L	1	1	16	14	4	
	Fundamentals of Information and Communication Network	L	2	2	32	28	6	
Foreign Languages	General English (1)	L	3	3	48	42	1	
	General English (2)	L	2	2	32	28	2	
	General English (3)	L	2	2	32	28	3	
	General English (4)	L	2	2	32	28	4	
General Courses	Situation and Policy	L	2	2	32	28	1-8	6 ECTS credits of

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	Ideology, Morality and the Rule of Law	L	3	0	48	42	1	other general elective courses are required
	Modern Chinese History	L	2	0	32	28	2	
	Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era	L	3	0	48	42	4	
	Marxism Basic Theory	L	3	0	48	42	5	
	Introduction to Mao Zedong Thought and Theory of Socialism with Chinese Characteristics	L	2	0	32	28	6	
	C Language Programming	L&P	3	4	48	72	1	
	Psychological Health Education	L	2	2	32	28	1-2	
	Career Development	L	1	1	16	14	1	
	Employment Guidance	L	1	1	16	14	6	
	Innovation and Entrepreneurship Foundation	L&P	2	2	32	28	3-4	
	Physical Education	L&P	4	8	144	96	1-4	
	Military Theory	P	2	0	36	24	1	
	Social Practice	P	2	4	60	60	1-8	
	Labor Studies for College Students	P	1	2	32	28	1, 3, 5, 7	
Practical Courses	Cognitive Practice	P	1	2	30	30	1	
	Metalworking Practice	P	1	2	30	30	2	
	Electrical and Electronic Practice	P	2	4	60	60	4	
	Academic Writing	P	1	2	30	30	4	
	Power Electronic Comprehensive Practice	P	1	2	30	30	5	

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	Motor and Drive Comprehensive Practice	P	1	2	30	30	5	
	Power System Relaying Protection Comprehensive Experiment	P	1	2	30	30	6	
	Electrical Engineering Comprehensive Design	P	2	4	60	60	6	
	Graduation Practice	P	4	8	120	120	7, 8	
	PLC Application Innovation Design	P	1	2	30	30	4	
	Ac and DC Speed Regulation System Comprehensive Design	P	1	2	30	30	5	
	Micro-controller Application Design	P	1	2	30	30	5	
	New Energy Generation and Application Comprehensive Design	P	1	2	30	30	6	
	Low-Voltage Distribution Technology Comprehensive Design	P	1	2	30	30	6	
	Energy Storage Technology and Application Comprehensive Design	P	1	2	30	30	6	
	Winding Wire Design and Machining Test	P	1	2	30	30	7	
	Power Quality Design and Testing	P	1	2	30	30	7	
	Innovation and Entrepreneurship Practice	P	2	4	60	60	1-8	
Bachelor's Thesis	Graduation Design (Dissertation)	P	12	28	240	600	7, 8	
Total European Credit Transfer System (ECTS) credits: 206, per semester European Credit Transfer System (ECTS) credits: 25.75								

