# Course – Graduation Requirements Support Matrix Table

I. Graduation Requirements

Students in this major shall meet the following graduation requirements:

**1. Engineering Knowledge:** Ability to integrate mathematical knowledge, natural sciences, fundamental engineering principles, and specialized professional knowledge to apply these skills in solving complex engineering problems within the field of electrical engineering, such as power systems, electrical energy conversion, and electrical control.

1.1 Ability to apply the linguistic tools of mathematics, natural sciences, and engineering sciences to formulating problems related to the field of electrical engineering.

1.2 Can establish mathematical models and solve them for specific objects within the field of electrical engineering.

1.3 Capable of applying relevant knowledge and mathematical modeling techniques to derive solutions and analyze complex engineering problems in the field of electrical engineering.

1.4 Capable of applying relevant knowledge and mathematical modeling methods to compare and synthesize solutions to complex engineering problems in the field of electrical engineering.

**2. Problem Analysis**: Ability to apply fundamental principles from mathematics, natural sciences, engineering fundamentals, and specialized knowledge to identify, articulate, and analyze complex engineering problems in the field of electrical engineering through literature review, thereby deriving valid conclusions.

2.1 Can apply relevant scientific principles to identify and assess the critical aspects of complex engineering problems in the field of electrical engineering.

2.2 Capable of correctly formulating complex engineering problems in the field of electrical engineering based on relevant scientific principles and mathematical modeling
methods.

2.3 Students should be able to recognize that there are multiple approaches to solving problems; they should be capable of seeking alternative solutions through literature review, apply fundamental principles in conjunction with literature review to analyze the influencing factors in the process, and derive valid conclusions.

**3. Design/Develop Solutions**: Capable of designing solutions for complex engineering problems in the field of electrical engineering; capable of designing power systems and individual components that meet specific requirements; demonstrating an innovative mindset while taking into account factors such as society, health, safety, legal considerations, culture, and the environment.

3.1 Master the fundamental design and development methods and techniques applicable across the entire lifecycle and process of engineering design and product development, and gain an understanding of the various factors that influence design objectives and technical solutions.

3.2 Capable of performing unit (component) design for complex equipment or power supply and distribution systems in the field of electrical engineering; capable of conducting

system or process flow design; and able to incorporate an innovative mindset into the design process.

3.3 When developing complex equipment or power supply and distribution systems that meet specific requirements, it is essential to take into account constraints related to safety, health, legal, cultural, and environmental factors.

**4. Research**: Ability to conduct research on complex engineering problems in the field of electrical engineering based on scientific principles and by employing scientific methods such as designing experiments, analyzing, and interpreting data, and to derive reasonable and effective conclusions through information synthesis.

4.1 The ability to develop solutions for complex engineering problems in fields such as electrical engineering based on scientific principles, through literature review, field investigations, and analysis.

4.2 Can select research approaches and design experimental schemes based on the characteristics of objects in the field of electrical engineering.

4.3 Capable of constructing an experimental system based on the designed experimental protocol, conducting experiments safely, and scientifically collecting experimental data.

4.4 Can analyze and interpret experimental results, and derive reasonable and effective conclusions through information synthesis.

**5. Use of modern tools**: Ability to develop, select, and utilize appropriate technologies, resources, modern engineering tools, and information technology tools to address complex engineering problems in the field of electrical engineering, including the prediction and simulation of such complex engineering problems, as well as the ability to understand their limitations.

5.1 Understand the principles and methods for using commonly employed information technology

tools and engineering tools in the Electrical Engineering and Automation major, as well as their limitations.

5.2 Understand the operating principles and usage methods of commonly employed modern instruments and simulation software in the Electrical Engineering and Automation major, as well as their limitations.

5.3 Students shall be able to select and utilize appropriate instruments, information resources, engineering tools, and professional simulation software to analyze, compute, and design complex engineering problems within the field of electrical engineering.

5.4 Students shall be able to develop or select modern tools tailored to specific objectives that meet particular requirements, simulate and predict problems related to electrical engineering and automation, and analyze their limitations.

**6. Engineering and Society**: Ability to conduct reasonable analyses based on relevant background knowledge in electrical engineering; to evaluate the impact of professional engineering practices and solutions to complex engineering problems on society, health, safety, law, and culture; and to understand the responsibilities that must be assumed.

6.1 Understand the technical standard system, intellectual property rights, industrial policies, and legal and regulatory frameworks pertaining to the field of electrical engineering, as well as the impact of various social and cultural contexts on engineering activities.

6.2 The ability to analyze and evaluate the impact of electrical engineering practice on society, health, safety, law, and culture, as well as the impact of these constraints on project implementation, and to understand the responsibilities that must be assumed.

**7. Environment and Sustainable Development**: Ability to understand and evaluate the impact of engineering practices addressing complex engineering problems in the field of electrical engineering on the environment and social sustainable development.

7.1 Promote the Scientific Outlook on Development and recognize the importance of national environmental protection policies and social sustainable development.

7.2 Students should be able to approach the sustainability of engineering practice within the field of Electrical Engineering and Automation from the perspective of environmental protection and sustainable development, and to evaluate the potential harm and risks that may arise during the product lifecycle to humans and the environment.

**8. Professional Standards**: Possess a foundation in humanities and social sciences and a sense of social responsibility; be able to understand and adhere to engineering professional ethics and standards in engineering practice, and fulfill their responsibilities.

8.1 Possess humanistic and social science literacy; understand and embrace the Core Socialist Values; be familiar with the national conditions of China; and comprehend the relationship between the individual and society.

8.2 Understand the engineering professional ethics and codes of conduct based on honesty, fairness, and integrity, and be able to consciously adhere to them in electrical engineering practice.

8.3 Understanding electrical engineers' social responsibility toward public safety, health, and well-being, as well as environmental protection, enables them to consciously fulfill their responsibilities in engineering practice.

**9. Individuals and Teams**: Possess a strong sense of teamwork and are able to assume individual, team member, or project leader roles within multidisciplinary teams.

9. 1 Possesses interpersonal communication skills and a strong sense of teamwork, enabling effective communication and collaboration with members from other disciplines.

9.2 Capable of working independently or collaboratively within a multidisciplinary context; capable of organizing, coordinating, and directing team efforts; and able to assume roles as both team member and team leader.

**10. Communication**: Ability to effectively communicate and interact with industry peers and the general public regarding complex engineering challenges in the field of electrical engineering; this includes drafting reports and design documents, delivering presentations, articulating ideas or responding to instructions clearly; possessing a certain international perspective; and being able to communicate and interact within cross-cultural contexts.

10.1 Be able to address issues pertaining to the Electrical Engineering and Automation major through oral presentations, written documents, charts, or other formats, accurately articulate one's viewpoints, respond to questions, and understand the differences in communication between oneself and industry peers as well as the general public.

10.2 To understand international development trends and research hotspots in the field of electrical engineering, and to comprehend and respect the differences and diversity of various cultures worldwide.

10.3 Possess language and written communication skills for cross-cultural interaction, enabling effective communication and exchange on professional issues within a cross-cultural context.

**11. Project Management**: Understand and master the principles of engineering management and economic decision-making methods, and be able to apply them in a multidisciplinary
environment.

11.1 Understand the cost composition in electrical engineering projects, and gain a thorough understanding and mastery of the management and economic aspects involved in such projects.

decision-making technique 。

11.2 Understand the cost composition across the entire lifecycle and process of electrical engineering projects and products, and gain an understanding of the engineering management and economic decision-making issues involved therein.

11.3 Demonstrate the ability to correctly apply engineering management and economic decision-making methods within a multidisciplinary environment when designing and developing electrical engineering-related solutions.

**12. Lifelong Learning**: Possess awareness of self-directed learning and lifelong learning; possess the ability to fully leverage their subjective initiative to engage in continuous learning to adapt to societal changes and the evolving landscape of electrical engineering.

12.1 Within the broader context of social development, individuals should recognize the necessity of continuous learning and develop an awareness of self-directed and lifelong learning.

12.2 Possess self-directed learning capabilities, including the ability to understand technical issues, to synthesize information, and to formulate questions, thereby enabling adaptation to societal needs and the evolving landscape of the electrical engineering industry.

II. Correlation Matrix Between Educational Objectives and Graduation Requirements

| Graduation Requ-irements | Train objective | | | | |
|---|---|---|---|---|---|
| | Educational Objectives 1 | Educational Objectives 2 | Educational Objectives 3 | Educational Objectives 4 | Educational Objectives 5 |
| Graduation Requireme - nts 1 | ▲ | | | | |
| Graduation Requireme - nts 2 | ▲ | | | | |
| Graduation Requireme - nts 3 | | ▲ | ▲ | | |
| Graduation Requireme - nts 4 | | ▲ | | | |
| Graduation Requireme - nts 5 | | ▲ | | | |
| Graduation Requireme - nts 6 | | | ▲ | | |

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| Graduation Requirements 7 | | | ▲ | | |
| Graduation Requirements 8 | | | ▲ | ▲ | |
| Graduation Requirements 9 | | | | ▲ | |
| Graduation Requirements 10 | | | | ▲ | ▲ |
| Graduation Requirements 11 | | | ▲ | ▲ | |
| Graduation Requirements 12 | | | | | ▲ |

Note: Place " ▲" in the corresponding graduation requirements and educational objectives.

III. Graduation Requirements and Curriculum Mapping Matrix

| Curriculum Class | Course title | Graduation Requirements | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| General Education Required Courses | Ideological and Moral Education and the Rule of Law | | | | | | H | M | M | | | | |
| | Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era | | | | | | | | H | | | | H |
| | Outline of Modern Chinese History | | | | | | | M | H | | | | |
| | Basic Principles of Marxism | | | | | | | | M | | | | H |
| | Introduction to Mao Zedong Thought and the Theoretical System of Socialism with Chinese Characteristics | | | | | | | | H | M | | | |

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| Class | Situation and Policy | | | | | | M | H | M | | | | |
| | College English | | | | | | | | | | H | | M |
| | Fundamentals of Information Science | | M | | | M | | | | | | | |
| | Physical Education | | | | | | | | M | M | | | |
| | Mental Health Education for College Students | | | | | | | | | M | H | | |
| | Entrepreneurship and Innovation Education, Career Planning, and Employment Guidance | | | | | | | | | H | H | | |
| | Military Theory and Military Training | | | | | | M | | H | L | | | |
| Core Required Courses in the Discipline | Higher Mathematics | H | H | | | | | | | | | | |
| | Fundamentals of Engineering Drawing | H | | | | | | | M | | | | L |
| | College Physics | H | M | | L | | | | | | | | L |
| | University Physics Laboratory | | | | M | M | | | | H | | | |
| | Linear Algebra | H | | | M | | | | | | | | L |
| | Complex Analysis and Integral Transforms | M | | | M | | | | | | | | |
| | Probability Theory and Mathematical Statistics | M | | | M | | | | | | | | |
| | C Programming Language | | | H | | M | | | | | | | |
| | Electromagnetic Field Theory for Engineering Applications | M | H | | | | | | | L | | | |
| | Discrete Mathematics | M | | | M | | | | | | | | |
| Required Courses | Introduction to Electrical Engineering | | | | | | M | H | | | | | M |
| | Principles of Electric Circuits | H | H | | M | | | | | | | | |
| | Analog Electronic Technology | H | H | M | M | | | | | | | | |
| | Digital Electronic Technology | H | H | M | M | | | | | | | | |
| | Automatic Control Principles | H | H | M | | M | | | | | | | |
| | Power Electronic | H | | | H | M | | L | | | | | |

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| for Pro-fessional Educat-ion | Technology | | | | | | | | | | | | |
| | Detection and Conversion Technology | M | H | M | | | | | | | | | |
| | Electrical Systems of Power Plants | M | | | | | | M | | | H | M | |
| | Power System Analysis | H | H | | H | M | | | | | | | |
| | Electromechanics | M | H | | M | | | L | | | | | |
| | Microcontroller Principles and Applications | M | | M | | | | | | | | | |
| | Electrical Control and PLC | | | H | M | M | | | H | | | | |
| | Power System Automation | | H | M | | | | | | | | | |
| | Power System Relay Protection | | M | H | H | | | | | | | M | |
| | High Voltage Technology | | M | M | | | | H | | | | | |
| | English for Electrical Engineering Majors | | | | | | M | | | | H | | M |
| Specialty | Engineering Training | | | | | | M | | | M | | | |
| | Professional Orientation Internship | | | | | | M | | M | H | H | | |
| | Literature Search and Scientific Paper Writing | | | | | | | | | | M | | M |
| | Electrical Equipment Assembly and Fabrication Practical Training | | | | | M | | | M | | | | |
| | C Language Programming Course Project | | | H | | M | | | | | | | |

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| Educational Practice | Mathematical Modeling and MATLAB Simulation | | H | | | H | | | | | | | |
| | Comprehensive Design of Electronic Technology | | | H | L | M | | | | | | | |
| | Integrated Design of Control System Modeling and Simulation | | M | | M | H | | | | | | | |
| | Course Design of Electrical Control and PLC | | | | M | H | | | | M | | | |
| | Configuration Control Technology Practical Training | | | | M | H | | | | | | | M |
| | Integrated Design of Electrical Engineering Drawing | | | L | | H | M | | | | | | |
| | Integrated Practical Training in Electrical Engineering | | | | | H | | | M | L | M | | |
| | Graduation Work | | | | | | M | | M | H | H | | |
| | Graduation Project | | | H | | | | H | | H | H | | M |
| | Labor Education | M | H | | | | M | | | | L | | |
| | Socialist Core Values Theme-based Practice | M | H | | | | M | | | | L | | |