Detailed Programme Structure and Semester Distribution

This document provides detailed programme structure including module semester distribution, student mobility, major transfer management, and curriculum review mechanisms.

1.5 Programme Structure

The curriculum system of the programme strictly follows the Outcome-Based Education (OBE) philosophy, takes training objectives and learning outcomes as the core guidance, and is constructed in layers according to the progressive logic of 'foundation laying – core strengthening – application expansion – practice implementation'. All modules are organically connected and progressive, covering all study semesters, and comprehensively support the steady improvement of students' engineering ability and comprehensive literacy. The semester distribution, core content and training objectives of each module are as follows:

1.5.1 Basic Science and Humanistic Literacy Module (Semesters 1-8)

Covering general education courses such as mathematics, physics, humanities and social sciences, ideological and political education, physical education, aesthetic education and military courses, running through the entire four-year study period to lay a solid foundation for students' comprehensive literacy.

Core courses: Advanced Mathematics, College Physics, Morality, Ethics and the Rule of Law, Outline of Modern and Contemporary Chinese History, Basic Principles of Marxism, Introduction to Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, Current Affairs and Policies, College Physical Education, Mental Health Education for University Students, Military Theory and Military Skills, College Chinese, Public Art, etc.

Training objectives: Consolidate students' mathematical foundation and scientific thinking, shape the awareness of the rule of law, patriotism and good professional ethics, improve physical and mental health and humanistic aesthetic literacy, and lay the foundation for in-depth professional study and lifelong career development.

1.5.2 Foreign Language and International Communication Module (Semesters 1-7)

Core courses: College English (Semesters 1–4), Special English for Electrical Engineering (Semester 5), foreign language general elective courses (Semesters 6–7).

Training objectives: Cultivate students' comprehensive abilities of listening, speaking, reading, writing and translation in foreign languages, enable them to independently study professional foreign literature and write English technical materials, possess cross-cultural communication ability and international vision, and adapt to the needs of international industrial development.

1.5.3 Communication, Cooperation and Innovation Module (Semesters 1-8)

Core courses: Innovation and Entrepreneurship Education and Career Planning, Employment Guidance, Second Classroom, Innovation and Entrepreneurship Electives, Discipline Competitions and Social Practice, etc.

Training objectives: Guide students to scientifically plan their careers, establish innovative thinking and engineering innovation awareness, improve project practice, teamwork and employment competitiveness, and support the cultivation of students' independent learning and lifelong development abilities.

1.5.4 Electrical Discipline Foundation Module (Semesters 1-4)

Core courses: Fundamentals of Engineering Drawing, Circuit Theory, Analog Electronic Technology, Digital Electronic Technology, C Language Programming, Engineering Electromagnetic Field Theory, etc.

Training objectives: Help students systematically master core basic theories and practical methods of circuits, electronics, drawing, electromagnetic fields, etc., build a solid engineering thinking and logical analysis system, and provide solid support for the study of professional core courses.

1.5.5 Core Electrical Engineering Professional Module (Semesters 5-6)

As the core link of talent ability cultivation of this programme, it is divided into three levels: professional theory, professional training and direction expansion, fully supporting the achievement of students' graduation requirements.

Core professional theory courses: Principles of Automatic Control, Power Electronics Technology, Electrical Machinery, Power System Analysis, Electrical Parts of Power Plants, Electrical Control and PLC, Power System Relay Protection, High Voltage Technology, Power System Automation, etc.

Professional training courses: Electrical Assembly and Production Training, Comprehensive Course Design of Electronic Technology, Control System Modelling and Simulation, PLC Course Design, Configuration Control Technology Training, etc.

Professional direction and frontier courses: Smart Grid Technology, New Energy Power Generation Technology, High-Voltage Direct Current Transmission, Electrical Equipment Fault Diagnosis, AC and DC Speed Regulation, Industrial Process Control, etc.

Training objectives: Enable students to proficiently master core professional knowledge such as power systems, electrical control, relay protection and electric energy conversion, possess capabilities of system analysis, equipment design, operation

commissioning and engineering practice, and accurately meet the core job demands of industries such as electric power, new energy and intelligent manufacturing.

1.5.6 Professional Expansion and Cutting-edge Technology Module (Semesters 3-6)

Core courses: Smart Grid Technology, New Energy Power Generation, High-Voltage Direct Current Transmission, On-line Monitoring of Electrical Equipment, AC and DC Speed Regulation, Basics of Industrial Economy and Management, Application of Artificial Intelligence in Power Systems and other expanded elective courses.

Training objectives: Support students to independently select courses according to personal interests and career direction, broaden the scope of professional knowledge, supplement frontier capabilities such as intelligent electrical engineering, new energy and engineering management, and comprehensively improve job adaptability and career competitiveness.

1.5.7 Professional Practice and Engineering Training Module (Semesters 1-8)

Adopting the school-enterprise collaboration and dual-supervisor training model, covering the whole chain of practical teaching including engineering experiments, course design, cognitive internship, special training, comprehensive training and graduation internship, running through the four-year schooling period.

Core links: Complete practical teaching links including engineering training, professional cognitive internship, course experiment and training, electrical assembly and production, comprehensive electrical engineering training and graduation internship.

Implementation mode: Cooperate with high-quality partner enterprises such as China Energy Investment Corporation Yangzonghai Power Plant to organise students to enter real engineering scenarios, guided by both senior enterprise engineers and on-campus professional teachers, to complete instrument operation, equipment commissioning, on-the-job practice and engineering project training tasks, strictly following industry safety operation procedures.

Training objectives: Promote the deep integration of theoretical knowledge and engineering practice, proficiently master the use of electrical professional instruments and simulation software, and improve students' capabilities of equipment operation, system operation and maintenance, on-site troubleshooting and emergency response; cultivate a rigorous and pragmatic engineering style, standardised professional literacy and engineering ethics, firmly establish awareness of engineering safety and quality control, and help students quickly adapt to workplace positions.

The construction of on-campus and off-campus training bases, school-enterprise cooperation resources and cooperation agreement details of this programme are detailed in Annex D-1 Electrical Professional Internship and Training Base Situation and Annex D-2 Representative Off-campus Enterprise Cooperation Agreements for Electrical Engineering Programme. The whole-process management of practical teaching is

implemented in accordance with Annex C-4 Kunming University Undergraduate Practical Teaching Management System (Revised).

1.5.8 Graduation Internship and Graduation Design Module

Implementation arrangement: In Semester 7, students carry out graduation internships in counterpart power, new energy and electrical equipment enterprises, and participate in front-line work such as equipment operation and maintenance, project commissioning and on-site technical disposal in real engineering sites. From Semester 7 to 8, based on the real engineering problems and technical difficulties encountered during the internship, students comprehensively apply the professional theories, practical skills and comprehensive literacy accumulated in the first seven modules over four years, and independently complete the whole process of research work including Chinese and foreign literature retrieval, engineering data research, modelling and simulation, system scheme design and technical demonstration under the joint guidance of on-campus professional tutors and enterprise internship dual supervisors, standardise the writing of graduation theses (designs) and participate in defence assessment.

Training objectives: Break through the barrier between theory and engineering practice through enterprise internship, and then integrate the four-year complete knowledge system through graduation design to possess the comprehensive ability to independently analyse and solve complex electrical engineering problems; master the basic methods of academic research, writing of engineering technical documents, achievement reporting and defence expression skills, and smoothly complete the professional role transformation from student to professional engineering and technical personnel; the assessment results of graduation internship and the achievements of graduation theses (designs) together serve as the core assessment basis for students' graduation qualification and bachelor's degree conferral. The whole-process quality management, format specifications and review standards of graduation design are detailed in Annex F-3 Kunming University Administration Measures for Graduation Theses (Designs) (Revised).

The eight curriculum modules fully cover and progressively support the training objectives and teaching learning outcomes of the programme, forming a complete education system of 'general education laying the foundation – basic knowledge building the bottom – core competence strengthening – practice empowering – comprehensive improvement', which accurately fits the school-running positioning of high-quality applied engineering and technical talents of this programme.

In summary, the proportion of courses in different competence fields in the curriculum plan and their distribution in semesters are shown in Figure 1.1and Figure 1.2 , Table 1-1 and Table 1-2 respectively. The overview of school and college operation and the overall training plan of the programme are detailed in Annex A-1 Introduction to Kunming University and School of Mechanical and Electrical Engineering.

Figure 1.1 Proportion of Courses in Different Competence Fields in the Curriculum Plan

Figure 1.2 Topology Diagram of Course Prerequisite-Successor Relationships

Table 1-1 Distribution of Courses in Different Competence Fields across Semesters 1–8

(Statistics by Course Category)

Table 1-2 Distribution of Courses in Different Competence Fields per Semester

(Proportion per Semester, each row sums to 100%)

1.5.9 Student Mobility

1.5.9.1 Recognition of Qualifications and Support Services

The standard duration of study for this programme is 4 years. The university's flexible study duration system supports students to complete their studies flexibly within 3–8 years, fully adapting to students' personalised development needs such as school-enterprise internships, innovation and entrepreneurship, inter-university visiting study, joint training and international exchanges. It allows students to reasonably adjust their academic progress, ensuring the flexibility and humanisation of study arrangements. The university has established a standardised and sound credit recognition, transfer and mutual recognition management system, which compliantly recognises students' learning outcomes from discipline competitions, innovation and entrepreneurship projects, school-enterprise co-construction courses, off-campus training, inter-university exchanges and international study tours, realising credit interoperability and mutual recognition in different learning scenarios, effectively ensuring the coherence and smoothness of students' academic progress and avoiding credit barriers in cross-platform learning.

To broaden student mobility channels and enrich development paths, the school continues to deepen domestic and international inter-university cooperation and school-enterprise collaborative education, actively build cross-school, cross-regional and international learning and practice platforms, and regularly promote high-quality projects such as domestic university visiting study, research assistants, enterprise-based research, international academic exchanges and overseas study tours. The programme continuously promotes curriculum docking, credit mutual recognition and joint training cooperation with similar electrical engineering programmes at home and abroad, continuously optimises the process of students' cross-school and cross-border learning, and improves the convenience and training quality of mobile learning. At the same time, the school builds a comprehensive student support service system, providing whole-process and one-stop services for various exchange learning projects in terms of system interpretation, credit conversion, formalities handling, academic planning, funding

subsidies and overseas adaptation guidance, fully motivating outstanding students to participate in high-quality domestic and overseas learning and exchange projects, helping students broaden their international horizons, accumulate cross-field engineering experience, and comprehensively improve career competitiveness and academic development potential.

1.5.9.2 Major Transfer Management

This programme focuses on core fields such as electrical engineering, power systems, automatic control and new energy electrical engineering, and is committed to cultivating high-quality applied engineering and technical talents, suitable for students with engineering logical thinking, rigorous and pragmatic literacy, and enthusiasm for electrical technology and engineering practice. To help freshmen accurately understand the connotation of the programme, clarify career development directions, and rationally match personal interests and development plans, the programme popularises the training system, core courses, industry prospects, job competence requirements and development paths of the programme to students in all aspects through diversified measures such as introductory courses, lectures by industry experts, sharing by enterprise tutors, regular opening of laboratories, on-site visits to school-enterprise cooperation sites and one-on-one career planning guidance, guiding students to objectively evaluate their adaptability and scientifically plan their academic and career directions.

To fully respect students' personalised development demands and ensure the autonomy and rationality of students' major selection, the university and the school have established a standardised, transparent, fair and just major transfer management system. During their study at the university, if students' personal interests and development plans are not well matched with their current major, they can apply for major transfer in accordance with the unified rules and regulations of the university and standard procedures. The relevant management requirements are strictly implemented in accordance with Annex A-3 Kunming University Student Handbook. The School of Mechanical and Electrical Engineering has formulated detailed implementation rules for undergraduate student major transfer (see Annex H-1 Implementation Rules for Major Transfer of the School of Mechanical and Electrical Engineering), clarifying application conditions, assessment standards, handling procedures and admission rules. The whole process is publicly announced and standardised, providing a smooth and orderly major transfer channel for eligible students with reasonable development needs. Statistics on major transfer in the past five years are detailed in Annex H-2 Statistics on Major Transfer in the Past Five Years. At the same time, the daily management of students, academic style construction, reward and punishment assessment of the school are strictly implemented in accordance with the relevant provisions in Annex A-5 Compilation of Student Management Work Systems of the School of Mechanical and Electrical Engineering.

Supporting documents: Folder 13 Recognition of Externally Acquired Academic Qualifications (a formal university-wide credit recognition policy is currently under development; see Section 6 "Identified Gaps and Areas for Improvement" for details).