Kunming University's Electrical Engineering and Automation Program: Educational Objectives and Graduation Requirements Continuous Improvement Record

Program Name: Electrical Engineering and Automation

School: School of Mechanical and Electrical Engineering

Record Period: September __2023__ – September 2025

Recorder: _Wang Lifang___

Reviewer: __Hu Zhongyu__

Record Date: __2025__ Year __3__ Month __25__ Day

I. Basic Information

1. Core objectives of this academic cycle: Based on the development needs of Yunnan's regional power industry and intelligent manufacturing sector, this program aims to cultivate applied senior engineering professionals who possess a solid foundation in mathematics, natural sciences, and engineering, along with specialized knowledge in electrical engineering; who master core technologies such as power systems, electrical energy conversion, and electrical control; who demonstrate strong engineering practical skills, an innovative mindset, and an international perspective; who adhere to engineering ethics and professional standards; and who are capable of engaging in electrical-related design, R&D, operation and maintenance, and management tasks within multidisciplinary environments—thereby meeting the EUR-ACE/ASIIN international engineering education accreditation standards.

2. The core content of this graduation requirement cycle covers 12 key requirements (Engineering Knowledge, Problem Analysis, Design/Development of Solutions, Research, Use of Modern Tools, Engineering and Society, Environment and Sustainability, Professional Ethics, Individual and Teamwork, Communication, Project Management, Lifelong Learning); it strictly aligns with the ASIIN TC02 specific standard and EUR-ACE clauses 5.2.1–12, while refining competency indicators in accordance with the program's distinctive characteristics.

3. Basis for improvement: the evaluation report on the achievement of training objectives for

this cycle, feedback from employer surveys, alumni follow-up records, expert opinions from the ASIIN/EUR-ACE certification process, updates on industry technological developments (such as applications of new technologies like smart grids and digital operation and maintenance), feedback from the university's teaching inspections (in accordance with the mid-term teaching inspection requirements of Kunming University), course achievement evaluation results, and feedback from both faculty and students.

II. Improving the startup background and problem diagnosis process

(1) Improving the launch background

To implement the OBE (Outcome-Based Education) philosophy, continuously enhance the quality of talent cultivation, align with the requirements for the continuous improvement of EUR-ACE/ASIIN engineering education accreditation—particularly in response to the transformation and upgrading of the regional electrical industry (e.g., in fields such as smart grids and electrical automation operation and maintenance)—and by integrating the evaluation results of the current cycle's achievement of educational objectives, feedback from the university's mid-term teaching inspection, and findings from industry research, this initiative to continuously improve educational objectives and graduation requirements has been launched. This effort aims to ensure that professional talent cultivation is synchronized with national strategies, local demands, and industry standards, while also addressing the core requirement of continuous quality system optimization stipulated in the ASIIN accreditation process.

(2) Core Issue Diagnosis (combining evaluation data with survey feedback)

1. Educational Objectives: There is insufficient alignment with the demands of emerging industries such as regional smart grids and new energy power generation; there is inadequate integration of digital and intelligent electrical technologies (e.g., intelligent grid maintenance, application of digital O&M platforms); the descriptions regarding the cultivation of an international perspective are not sufficiently specific; and the program fails to fully reflect the requirements for new technologies and new processes within the industry.

2. Graduation Requirements:

(1) Engineering practical competencies (Articles 3 and 4): Some practical components are disconnected from the actual job requirements of enterprises; the proportion of engineering practical application cases in graduation projects (theses) is relatively low; there is a lack of training tailored to specific real-world scenarios such as the operation and maintenance of intelligent electrical equipment and fault diagnosis in power systems; therefore, the alignment with Articles DE1 and RE1 of ASIIN TC02 requires further improvement.

(2) Use of modern tools (Article 5): There is insufficient training on the application of mainstream intelligent design and simulation software in the industry (e.g., advanced MATLAB applications, operation of intelligent monitoring systems for electrical equipment); students' understanding of the limitations of these tools is not sufficiently deep, and skills related to digital O&M tools are not fully covered.

(3) Communication Skills (Article 10): There is insufficient emphasis on developing bilingual communication skills, cross-cultural communication abilities, and proficiency in writing technical reports in English, making it difficult to fully meet the requirements specified in Clause CO1 of ASIIN TC02 and the needs of international engineering exchanges.

(4) Lifelong Learning (Article 12): The curriculum system lacks sufficient coverage of cutting-edge technologies (such as smart grids and electrical robotics applications); there is a lack of systematic design for cultivating students' ability to engage in self-directed learning and continuously update their knowledge; and it fails to adequately address the demands of rapid technological iteration within the industry.

3. Support System: The alignment between the curriculum system and graduation requirements requires further optimization; certain course contents lag behind advancements in industry technology; the deep collaboration with industry-practice bases is insufficient, making it difficult to effectively support the fulfillment of engineering practice-related graduation requirements; furthermore, there is a gap between these conditions and the requirements for the establishment of the Modern Industry College at Kunming University.

III. Improvement Objectives

1. Optimizing educational objectives: Further aligning with the industrial demands of Yunnan's regional smart grid, new energy, and intelligent manufacturing sectors; integrating relevant requirements for digital and intelligent electrical technologies; clarifying the educational orientation toward fostering an international perspective and lifelong learning capabilities; ensuring full alignment with EUR-ACE/ASIIN standards, industry trends, and the institution's educational positioning; and simultaneously addressing the requirements of the ASIIN accreditation process regarding the alignment of the program with industrial development needs.

2. Refining the graduation requirements: The 12 graduation requirement competency indicators have been further detailed, with a focus on strengthening the cultivation of engineering practice, application of modern tools, bilingual communication skills, and lifelong learning capabilities; this ensures that each requirement is supported by clearly defined supporting courses and practical components, fully aligning with the ASIIN TC02 special standard and EUR-ACE clause 5.2.1−12, thereby enhancing the measurability and attainability of the graduation requirements.

3. Strengthening the support system: Optimizing the curriculum structure, updating course content, and adding course modules related to cutting-edge industry technologies; deepening university-enterprise collaboration, expanding practical training bases, and reinforcing practical teaching components to ensure that educational objectives and graduation requirements are effectively implemented, thereby establishing a closed-loop mechanism of

"evaluation–diagnosis–improvement–verification" that complies with the quality teaching monitoring and continuous improvement requirements of Kunming University.

4. Enhancing Achievement Quality: Through continuous improvement efforts, we aim to increase the achievement rate of educational objectives to above 85%, raise employer satisfaction to above 92%, and elevate the alignment rate of graduates 'majors with their intended careers to above 88%; these goals are designed to ensure a smooth passing of the mid-term review and renewal process for the ASIIN/EUR-ACE accreditation, while simultaneously meeting the university's requirements for enhancing teaching quality.

IV. Specific Improvement Measures and Implementation Process

Improvement Module	core problem	Specific improvement measures	Implementation Date	Responsible Entity	Overview of Implementation Process	Supporting materials
Optimization of Educational Objectives	Insufficient alignment with emerging industries, and the description of an international perspective lacks specificity.	1. Conduct research visits to Guoneng Yangzonghai Power Generation Co., Ltd., Yunnan Yunnei Power Machinery Manufacturing Co., Ltd., and Yunnan Kunchuan Intelligent Equipment Co., Ltd.; invite	September 2023 – September 2025	Program Development Team, Corporate Mentors	Conducted research visits to 3–5 enterprises, organized two industry expert consultation sessions, collected feedback, revised the formulation of the training objectives based on the research findings,	Enterprise Expert Review Opinion Form

		industry experts and corporate mentors to participate in the validation of the training objectives, thereby incorporating emerging technological requirements such as smart grids, digital operation and maintenance, and new energy power generation.			and emphasized the cultivation of digital and intelligent capabilities.	
		2. Clarify the international perspective cultivation requirements by incorporating provisions regarding	September 2023 – September 2025	Program Development Team, Key Faculty Members	Revise the educational objectives document by adding content related to cultivating an international perspectiv	Revised Educational Objectives and College Review Comments

		bilingual courses and international engineering case-based teaching, thereby aligning with the cross-cultural communication requirements of the ASIIN accreditation.			e; in alignment with Clause CO1 of ASIIN TC02, clarify the educational orientation for developing bilingual communication skills and international engineering exchange capabilities; and submit the revised document to the College Teaching Work Committee for review.	
Graduation Requirements: Enhanced	The disconnect between engineering practice skills and corporate demands	1. Optimize the practical teaching system by increasing the duration	September 2023 – September 2025	Program Development Team, Practical Teaching Coordinator	The university has signed practical teaching cooperation agreements with	University – Enterprise Cooperation Agreement, Practical Teaching Syllabus,

		of enterprise internships, incorporating actual corporate projects as topics for course design and graduation projects (theses), collaborating with enterprises to develop practical teaching content, and designing practical projects based on the technical standards of industry master craftsmen.			entities such as Guoneng Yangzonghai Power Generation Co., Ltd.; 20 new real-world project topics have been added; practical teaching has been integrated with real-world scenarios such as intelligent power grid maintenance and electrical equipment fault diagnosis; the practical teaching syllabus has been revised; and the internship management requirements of Kunming University	and Graduation Project Topic List

					have been fully implemented.	
	Insufficient proficiency in using modern tools	2. Add course modules related to intelligent electrical design and simulation software (e.g., MATLAB Advanced Applications, Intelligent Monitoring System for Electrical Equipment); incorporate practical tool application sessions into the core professional courses, where the applicable scope and limitations of these tools will be explained.	September 2023 – September 2025	Key Faculty Member, Laboratory Supervisor	The curriculum syllabus has been revised to include new practical training modules on tool application; relevant software has been procured; three rounds of teacher training have been conducted; student tool application competitions have been organized to enhance students' tool operation skills; and these efforts aim to	Revised curriculum syllabus, software procurement contract, teacher training records, and competition award certificates

					align with the technical requirements of digital operations and maintenance.	
	Insufficient bilingual communication skills	3. Offer bilingual courses (e.g., "Electrical Control Engineering (Bilingual)"), incorporate training in English technical report writing and bilingual presentations, invite foreign experts to deliver lectures, and align these initiatives with the international exchange requirements for ASIIN	September 2023 – September 2025	Key Faculty Members, Foreign Affairs Office	Two bilingual courses were established; the syllabi for these courses were revised; students were organized to participate in training sessions on writing English technical reports; and foreign experts were invited to deliver two lectures, all aimed at enhancing students'	Bilingual Course Syllabus, Lectures by Foreign Experts, Sample Student English Reports

		certification.			bilingual communication and international exchange skills.	
	Insufficient cultivation of lifelong learning skills	4. Introduce elective courses on cutting-edge industry technologies (e.g., smart grid technology, electrical robotics applications); offer self-directed learning guidance courses; establish a platform for sharing insights on cutting-edge technologies; and encourage students to stay informed about new technologi	September 2023 – September 2025	Program Development Team, Key Faculty Members	Three new elective courses have been added; an independent learning guidance plan has been developed; an online platform for sharing cutting-edge technologies has been established; and four technical sharing events have been organized for students, aiming to cultivate their ability for self-directed	Elective Course Syllabi, etc.

		es and processes in the industry.			learning and continuous knowledge updating.	
Support System Optimization	The curriculum system does not adequately align with the graduation requirements.	1. Revise the talent cultivation program, optimize the curriculum system, clarify the supporting role of each course in meeting the graduation requirements, update course content, remove content that lags behind industry developments, incorporate new technologies and standards, and establish a correspondence	September 2023 – September 2025	Program Development Team and All Key Faculty Members	Organized three seminars with key faculty members to discuss the curriculum system; revised the talent cultivation plan and course syllabi; refined the alignment matrix between graduation requirements and the curriculum system; and ensured that each graduation requirement is supported by clearly defined supporting	Revised Talent Development Program, Course Syllabi, Graduation Requirements, and Course Mapping Matrix

		matrix linking the graduation requirements with the curriculum system.			courses, with all revisions submitted to the Academic Affairs Office for review.	
	The depth of school-enterprise cooperation is insufficient.	2. Deepen university-enterprise cooperation by expanding partnerships with 3–4 high-quality practical training bases, inviting corporate mentors to participate in teaching activities and graduation project guidance, establishing joint university-enterprise laboratories, and fulfilling the requirements for the establishm	September 2023 – September 2025	Program Development Team; College's Enterprise Collaboration Lead	The university will sign in-depth cooperation agreements with enterprises, hire 8–10 corporate mentors, and establish one university-enterprise joint laboratory; these corporate mentors will participate in teaching and graduation project guidance, thereby enhancing the relevance	Deep School–Enterprise Cooperation Agreement, Corporate Mentor Appointment Letter, and Joint Laboratory Establishment Plan

		ent of the Modern Industry College at Kunming University.			and effectiveness of the practical education.	

V. Verification and Analysis of Improvement Effects

(1) Verification Method

This study employs a combination of data statistical methods, questionnaire surveys, expert review methods, and benchmarking analysis, in alignment with the teaching quality monitoring requirements of Kunming University, to validate the effectiveness of the improvements implemented. These specific measures include: graduate follow-up surveys, employer satisfaction surveys, course achievement evaluations, expert reviews (comprising both internal and external experts as well as ASIIN-certified experts), re-evaluations of the attainment of educational objectives, and verification of feedback from teaching inspections.

(2) Verification Results

1. Educational Objectives: The revised educational objectives have been endorsed by industry experts and corporate mentors; their alignment with the demands of regional emerging industries has been significantly enhanced; their international perspective-oriented approach is clearly defined and fully consistent with the EUR-ACE/ASIIN accreditation standards and the institution's educational positioning; and they have passed review by the College's Teaching Work Committee.

2. Graduation Requirements:

(1) Engineering practical competence: The proportion of actual enterprise projects selected as topics in graduation projects (theses) has increased; students' practical deliverables (such as electrical design schemes and fault diagnosis reports) have received recognition from enterprises, thereby complying with the requirements specified in clauses DE1 and RE1 of ASIIN TC02.

(2) Use of modern tools: Students' proficiency in applying mainstream intelligent design and simulation software has improved significantly; more than 80% of students are now able to independently complete tool operation and application analysis, identify the limitations of these tools, and achieve higher completion rates in courses related to tool application.

(3) Communication Skills: Students have demonstrated significant improvement in bilingual communication and English technical report writing; the satisfaction rate with bilingual course evaluations reached 90%; students have performed well in cross-cultural communication scenarios, meeting the requirements specified in Clause CO1 of ASIIN TC02.

(4) Lifelong learning capability: Students' awareness of self-directed learning has strengthened; more than 85% of students participate in elective courses on cutting-edge technologies and technology-sharing activities, and actively monitor developments in new industry technologies, thereby meeting the requirements specified in EUR-ACE clause 5.2.12.

3. Support System: The correspondence between the curriculum system and the graduation requirements has become more clearly defined; course content aligns closely with industry developments; university-enterprise cooperation has been significantly strengthened; practical training bases effectively support practical teaching; and the institution has passed the university's teaching inspection and verification process, thereby meeting the teaching quality assurance requirements of Kunming University.

4. Overall Quality Achievements: The attainment rate of educational objectives has been improved to [value not specified], employer satisfaction has been raised to 95%, and the alignment rate of graduates' majors with their intended careers has been increased to 90%; all these metrics have met the improvement targets.

(3) Effect Analysis

These improvement measures are highly targeted and implemented in a standardized manner, effectively addressing the core issues between educational objectives and graduation requirements; they have achieved deep alignment between talent cultivation and industry demands as well as international standards, thereby fulfilling the expected improvement goals. However, several shortcomings remain: first, the faculty strength for some cutting-edge technology courses still requires enhancement; second, the depth of university-enterprise collaborative training can be further increased; and third, the cultivation of students' cross-cultural communication skills needs long-term reinforcement. Further efforts will be required to continuously optimize these aspects to ensure compliance with the continuous improvement requirements of the ASIIN accreditation and the teaching quality enhancement objectives of Kunming University.

VI. Outstanding Issues and Next Steps for Improvement

(1) Unsolved issues

1. There is a shortage of core faculty members for cutting-edge technology courses (such as smart grids and electrical robotics applications); some instructors lack practical industry experience, making it difficult to fully meet the demands for course instruction and practical guidance, and creating a gap between current teaching practices and the pace of technological advancement in the industry.

2. The depth of school-enterprise collaborative training remains insufficient; enterprises' enthusiasm for participating in teaching activities and the formulation of talent development programs still needs to be enhanced; the alignment between practical teaching content and the job requirements of enterprises can be further optimized; thus, it has not yet fully met the depth requirements for establishing a modern industrial college.

3. The cultivation of students' cross-cultural communication skills lacks systematicness and

long-term commitment; there is insufficient practical training in writing English technical reports and engaging in international engineering exchanges, leaving a gap compared with the advanced requirements for cross-cultural communication specified in the ASIIN certification.

(2) Next Steps for Improvement

Unresolved Issues	Next steps for improvement	Implementation Timeline	Responsible Entity	expected goal
Shortage of faculty members for cutting-edge technology courses	1. Attract cutting-edge industry talent and hire key technical professionals from enterprises as part-time faculty members; 2. Organize key faculty members to participate in industry training programs and undertake temporary assignments at enterprises to enhance their practical industry experience; 3. Establish collaborations with universities and research institutes to share high-quality teaching resources.	September 2025 – September 2027	Program Development Team, College Human Resources Department	Three to four new key faculty members will be recruited; more than 80% of instructors for cutting-edge technology courses will possess industry practical experience, enabling them to effectively support both course instruction and practical guidance, thereby aligning with the evolving technical demands of the industry.

The collaboration between universities and enterprises in joint talent cultivation lacks depth.	1. Establish industry-academy colleges together with enterprises to jointly develop talent cultivation plans and curriculum systems; 2. Promote joint student recruitment and joint training initiatives, as well as implement customized training programs; 3. Encourage enterprises to donate equipment and co-build practical training bases to enhance the relevance of practical teaching.	September 2025 – September 2027	Program Development Team; College's Enterprise Collaboration Lead	One industry-university co-established industrial college has been established, with enterprises deeply involved in every stage of talent cultivation; the alignment between practical teaching content and enterprise job requirements exceeds 90%, thereby fulfilling the requirements for the construction of modern industrial colleges at Kunming University.
Students' cross-cultural communication skills are insufficient.	1. Increase the number of bilingual courses and introduce international engineering exchange and practical training courses; 2.	September 2025 – September 2027	Program Development Team, Key Faculty Members, International Affairs Office	Students' bilingual communication skills and ability to write technical reports in English have been significantly enhanced; they

	Organize students to participate in international engineering competitions and academic exchange activities; 3. Establish an international exchange platform, foster cooperative exchanges with foreign universities, and invite foreign experts to deliver regular lectures.			are now capable of participating proficiently in international engineering exchanges, fully meeting the requirements specified in Clause CO1 of ASIIN TC02, thereby broadening their global perspective.

VII. Review Comments

(1) Reviewer's Comments

The ongoing continuous improvement process for this training program's objectives and graduation requirements is supported by solid evidence, accurate problem identification, concrete measures, and standardized implementation; the improvement outcomes have been significant, successfully achieving the expected improvement goals, complying with the continuous improvement requirements of the EUR-ACE/ASIIN accreditation as well as the Teaching Quality Monitoring and Improvement Guidelines of Kunming University; all unresolved issues are clearly defined, and the next phase of improvement plan is feasible. We hereby approve the submission for review and approval.

Reviewer's Signature: ____ Date: ____ Month, ____ Year

(2) Reviewer's Comments

We approve the outcomes of this continuous improvement initiative, acknowledge the remaining unresolved issues, and endorse the subsequent improvement plan. The Professional Development Team is requested to strictly implement the next set of improvement measures, regularly monitor the effectiveness of these improvements, and continuously optimize the educational objectives and graduation requirements to ensure a sustained enhancement of talent cultivation quality, facilitate the successful completion of the mid-term review and

renewal of the ASIIN/EUR-ACE accreditation, and align with the university's teaching quality development requirements.

Approver's Signature: ____ Date: ____ Month, ____ Year