APPENDIX 2.1.1 Expected Learning Outcome

EXPECTED LEARNING OUTCOMES

The Expected Learning Outcomes (ELOs) or competencies of the graduates of the Bachelor of Education in Electrical Engineering Study Program are adapted from the established graduate profile. Based on the input from the alumni, industry, and professional association, the curriculum development team formulates the graduate competencies.

According to the state ideology and culture of the nation of Indonesia, the national education system implementation at the Electrical Engineering Bachelor's Study Program in each IQF qualification level (Level 6) involves a process that nourishes the attitude, knowledge, as well as specific and general skills. The Expected Learning Outcomes (ELOs) of the Electrical Engineering Bachelor's Study Program can be seen in Table 1 below.

Table 1. Expected Learning Outcome

ELO Code	ELO Description	Sub-ELO Code	Sub-ELO Description
ELO 1 (A.1.)	Demonstrate piousness to God, high loyalty to academic values, norms, and ethics.	A.1.1	Being pious to God Almighty and able to demonstrate religiousness, honesty, and patience.
		A.1.2	Upholding humanity values in conducting duties based on religion, moral, and ethics.
		A.1.3	Embodying academic values, norms, and ethics.
ELO 2 (A.2.)	Demonstrate nationalism, responsibility, and tolerance to both society and environmentnt.	A.2.1	Playing a role as a citizen who loves and is proud of the nation with a sense of nationalism and responsibility to the state and nation.
		A.2.2	Obeying the law and discipline in the life in the community and state.
		A.2.3	Respecting the diverse cultures, views, religions and beliefs, as well as opinions or original invention of others.
		A.2.4	Contributing to the improvement of the quality of life in the community, the nation, the state, and the advancement of civilization based on Pancasila.
		A.2.5	Working together and having the social sensibility as well as caring on the people and environment.
ELO 3 (A.3.)	Capable to perform professional works in his/her field of expertise both	A.3.1	Embody the spirit of independence, struggle, and entrepreneurship.
		A.3.2	Demonstrating responsibility on the respective profession of expertise in an independent manner.

ELO Code	ELO Description	Sub-ELO Code	Sub-ELO Description
	individual and team works.	A.3.3	Develop and maintain professional network with advisors, colleagues, and peers whether in or outside the institution.
ELO 4 (K.1.)	Master in basic sciences and principles of electricity	K.1.1	Knowledge on the principles of Mathematics and Physics in relation to the principles of electrical power
		K.1.2	Knowledge on the law and basic theories of electricity.
ELO 5 (K.2.)	Master in work standards, work methods, work implementations, and testing in electric power or industrial automation expertise.	K.2.1	Knowledge on developing scientific paper, including work report that is in line with scientific procedure based on the analysis, information, and data, and the ability to interpret and communicate in an accurate and accountable manner in order to solve problems and phenomena related to the occupation.
ELO 6 (S.1.)	Capable to make plans, implement, and evaluate learning in electric power or industrial automation expertise	S.1.1	Apply education management at school and training institution in the field of electrical engineering
		S.1.2	Manage the laboratory and workshop at training center and technology and vocational education according to the provisions of the work safety and health standards in the field of electrical engineering
		S.1.3	Apply information and communication technology in conducting duties as instructor and educational staff
		S.1.4	Facilitate, assess, and implement the learning process and learning results in a professional manner, as well as building community partnership in the scope of vocational education in conducting duties of the teacher profession
ELO 7 (S.2.)	Capable to manage vocational education and training of electrical engineering expertise by utilizing information and communications technology	S.2.1	Knowledge on the design, analysis, and application of measuring system in relation to the quantity and quality of electrical power engineering or industrial automation.
		S.2.2	Knowledge on the power plant, distribution, use, installation, and electrical automation engineering in businesses and industry according to the standards and principles that apply generally and are relevant with electrical power and renewable energy.
		S.2.3	Deciding the materials for design porpoises and installation in relation to electrical power engineering or industrial automation.
		S.2.4	Knowledge on the safety system of electrical power engineering for the safety of the

ELO Code	ELO Description	Sub-ELO Code	Sub-ELO Description
			equipment, as well as the safety and health of the users.
		S.2.5	Knowledge on identifying, formulating, and solving the control system in the electrical power engineering or industrial automation
		S.2.6	Analyze and solve regular technical problems in relation to electrical power engineering by applying the principles of mathematics, physics, and chemistry
		S.2.7	Identify and solve current and future problems of electrical power engineering or industrial automation using the laws and basic theories of electricity in the scope of wider applications.
		S.2.8	Apply new technologies to design, analyze, and apply measuring system in relation to the quality and quantity of electrical power engineering or industrial automation to fulfill the needs of the society in a professional and ethical manner.
		S.2.9	Perform an analysis in relation to the material application in relation to electrical power engineering or industrial automation for the development of renewable energy regeneration
		S.2.10	Have full understanding on the general theory of electrical power plant and energy efficiency.
		S.2.11	Apply the applied standards in electrical power or industrial automation system (PUIL, IEC, IEEE and other standards)
		S.2.12	Have full understanding and mastery on the transmission theory and electrical power distribution.
		S.2.12	Apply measuring theory and electrical parameter measuring equipment.
		S.2.13	Apply electrical theories (single line diagram, wiring diagram, the laws of electricity, and electrical circuit).
		S.2.14	Have full mastery and applying electrical installation engineering for commercial and industrial purposes of one or three phases.
		S.2.15	Have full mastery on the concept of electrical power quality and how to conduct repairmen of electrical power profile.
		S.2.16	Have full mastery of automation engineering for electrical power and renewable energy (magnetic contactor, electronic power PLC and microcontroller);

ELO Code	ELO Description	Sub-ELO Code	Sub-ELO Description
		S.2.17	Have full mastery and apply maintenance and repairmen methods for electrical power or industrial automation system.
		S.2.18	Apply electrical power engineering safety system for safety of the equipment as well as user health and safety.
ELO 8 (G.1.)	Capable to apply research and scientific writing methods	G.1.1	Implement strategies, media, learning materials, and learning assessment on technology and vocational education in the field of electrical engineering
		G.1.2	Apply innovative learning models that are relevant with the characteristics of the students.
		G.1.3	Manage independent learning.
		G.1.4	Knowledge on pedagogical and didactical concepts in preparing the lesson plan of technology and vocational education in the field of electrical engineering.
		G.1.5	Knowledge on the concept of learning strategy development, and learning media of technology and vocational education in the field of electrical engineering.
ELO 9	Capable to develop a vocational education innovation and publish scientific paper	G.2.1	Apply logical, critical, systematic, and innovative thinking in the context of knowledge and/or technology development or implementation based on the respective field.
		G.2.2	Study the implications of the development or implementation of knowledge, technology and art based on the respective field according to the scientific principles, procedure and ethics to generate solutions, ideas, designs or art criticisms, in addition to developing scientific descriptions of the result of the study in the form of thesis or final assignment report.
		G.2.3	Make decisions in an accurate manner in the context of problem- solving in the respective field based on the analysis on information and data.
		G.2.4	Develop scientific paper report that meets the scientific procedure based on analysis information and data, as well as interpret and communicate in an accurate and accountable manner to solve problems and issues related to the occupation