

**EAC of ABET**

**Readiness Review Report**

**for the**

**Electrical Engineering Study Program**

**at**

**Hasanuddin University**

**Makassar**

**January 31th, 2021**

**CONFIDENTIAL**

The information supplied in this Readiness Review Report is for the confidential use of ABET and its authorized agents, and will not be disclosed without authorization of the institution concerned, except for summary data not identifiable to a specific institution.

# BACKGROUND INFORMATION

## Contact Information

Prof. Dr.-Ing. Ir. Faizal A. Samman

Department of Electrical Engineering

Kampus Gowa, Fakultas Teknik, Universitas Hasanuddin

Jl. Poros Malino Km. 6, Bontomarannu 92171

Kab. Gowa, Sulawesi Selatan, Indonesia

Fax. +62 411 585 188

Telp. +62 411 585 015 / +62 411 586 262

e-mail: faizalas@unhas.ac.id

Mobile: +62 823 4913 0451

## Program History

The Electrical Engineering Study Program (EESP) at Hasanuddin University, Makassar, Indonesia was founded in 1963 as a part of the Faculty of Engineering established a few years earlier. The campus was originally located at Baraya, near the downtown of Ujung Pandang which was the old name of the city of Makassar. In early 1980s, the university campus was relocated to Tamalanrea, about 10 km north-east of downtown Makassar.

More than 30 years later, the Faculty of Engineering was relocated again to its new campus at Gowa, 20 km south of Tamalanrea, and the EESP - under the Department of Electrical Engineering - officially settled at its new facilities in the new campus at Gowa in 2017.

During the first years after its establishment in mid 1960s, most EESP students of Hasanuddin University continued and completed their undergraduate degrees in 2 (two) major universities in Indonesia, namely Gadjah Mada University (UGM) in Yogyakarta and Bandung Institute of Technology (ITB) in Bandung. The majority of the graduates from this period made their careers as academicians, or as engineers at the state-owned power company (PLN) and telecommunication (TELKOM), or started their own private companies related to electricity and telephone businesses. Among the first graduates of the EESP was the retired Prof. Muhammad Arief (Dean of Engineering, 1998-2002), graduated at July 7, 1975. The founder and the first chairman of the EESP was the late Ir. J. Pongrekun, M.Sc. who graduated from a US university in the late 1950s. He was promoted to become the first Dean of Engineering, and his successor as the chairman of the EESP was the late Prof. Dr. Ir. R. Cambari Sakka, M.Eng.Sc., who studied in Australia and Germany for his continuing education. Dr.Eng. Dewiani is the current chairperson, she succeeded Prof. Salama Manjang, Prof. Andani, Dr. Zahir Zainuddin, M.Sc. and Prof. Ansar Suyuti, consecutively.

The first major change of curriculum was implemented in 1980. The EESP was split into 2 (two) sub-study programs or concentrations, namely: (1) The Electrical Power Engineering and (2) The Telecommunication and Electronic Engineering. It was an 8 (eight) semester undergraduate engineering study program provided in 4 (four) academic years. In the first three semesters, the students took common courses on the fundamentals of Electrical Engineering and the required mathematics, physics and chemistry. Beginning at the fourth semester, the students voluntarily selected their preferences of concentration, and took different required and elective courses accordingly.

The next stage of curriculum development was started in 1995. A new concentration was established by divided the Telecommunication and Electronic Engineering sub-study program into 2 (two), i.e. (1) The Telecommunication Engineering and Information Systems, and (2) The Computer, Control and Electronic Engineering sub-study programs. Common courses for both new concentrations were listed until the fourth semester. The basis of the curriculum establishment was the nationally decreed higher education curriculum development in Indonesia: Competency-Based Curriculum (KBK).

Most recently, a major change in the EESP curriculum was made related to the campus relocation to Gowa in 2015. The new campus is designed to support the Laboratory-based Education (LBE) system adopted by the Faculty of Engineering. By this time the EESP has established its Masters and Doctoral Degree programs supported by no less than 20 research laboratories and working groups (see Table 1-2 in the next section). The process of curriculum development was managed by a Focus Group Discussion (FGD) on Curriculum 2015 in a 5 (five) year working period from 2012 to 2017, with a tagline: “From Competency To Contribution”.

The main idea of the 2015 Curriculum change is to extend the competency-based curriculum previously implemented to a brand new curriculum called the “R&D (research and development)-based curriculum”. The existing (since 1995) three concentrations were discontinued and all merged back to only one EESP. The curriculum structure is now composed of 4 (four) semesters of fundamentals and 2 (two) semesters of (elective) course packages to develop the competency, and the final laboratory-based, or R&D-based, 2 (two) semesters to create some sort of contribution based on the com- petency developed in the previous 6 semesters.

The timeline of the EESP 55 year history is summarized in Table 1. After 1995, in fact the EESP curriculum has been revised every 5 (five) years, in 2000, 2005 and 2010 consecutively, but only with minor revisons. Complying with the national regulation on higher education, the EESP is periodically accredited by BAN-PT (the National Accreditation Body for Higher Education), recently with the highest level of accreditation “**A**” (BAN PT Decree Number 1644/SK/BAN-PT/Akred/S/V/2017 expired on May 30 2022). The Readiness Report was submitted in September 2018 to begin the ABET accreditation process. The final statement from ABET was received in Fall 2019 for the acreditation in the period of 2020-2022. Another international accreditation, IABEE, is also in the process beginning in Fall 2020.

**Table 1-1** Summary of Major Changes in the History of Hasanuddin University.

|  |  |
| --- | --- |
| **Year** | **Events** |
| 1963 | The Electrical Engineering Study Program (EESP) founded |
| 1980 | Split into 2 (two) sub-study programs: |
|  | (1) Electrical Power Engineering Sub-Study Program |
|  | (2) Telecommunication and Electronic Engineering Sub-Study Program |
| 1984 | Relocated from Baraya Campus to Tamalanrea Campus |
| 1995 | Split into 3 (three) concentrations: |
|  | (1) Electrical Power Engineering |
|  | (2) Telecommunication Engineering |
|  | (3) Computer, Control and Electronic Engineering |
| 2000 | Minor Revisions of Curriculum |
| 2005 | Minor Revisions of Curriculum, competency-based curriculum (KBK) |
| 2010 | Minor Revisions of Curriculum, competency-based curriculum (KBK) |
| 2012 | Focus Group Discussion (FGD) on Curriculum 2015 established |
| 2015 | Relocated to the Faculty of Engineering Campus at Gowa |
|  | Commencement of the Laboratory-based Education System (LBE) |
| 2016 | Implementation of the R&D-based Curriculum 2015 |
| 2017 | Focus Group Discussion (FGD) on Curriculum 2015 dismissed |
| 2018 | Curriculum 2020 Development Task Force established |
| September 2018 | The Readiness Report submitted to ABET |
| Fall 2019 | ABET Accredited for the period of 2019-2022 |
| Fall 2020 | Beginning of the IABEE Accreditation Process |
| January 2021 | Curriculum 2020 Submitted to the Academic Senate |

The most recent curriculum change is made in 2020. The main idea of the new 2020 Curriculum change is to accommodate ABET criteria especially the criterion that requires the program to include a culminating major engineering design experience that incorporates appropriate engineering standards and multiple constraints. The new 2020 Curriculum has a capstone experience that is culminated in 3 (three) courses, i.e. *Electrical Engineering Design 1 and 2*, and *Final Project (Skripsi)*. In addition the new 2020 Curriculum has an assessment and evaluation system so that the program is able to regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained. The results of these evaluations will be systematically utilized as input for the continuous improvement of the program.

Until the recent graduation in June 2020, the EESP has graduated **2826**  Sarjana Teknik (S.T.), a degree equivalent to the BS in the US, as shown in Table 2.

Table 2: The Total Number of GraduaTES, 1975–2019.

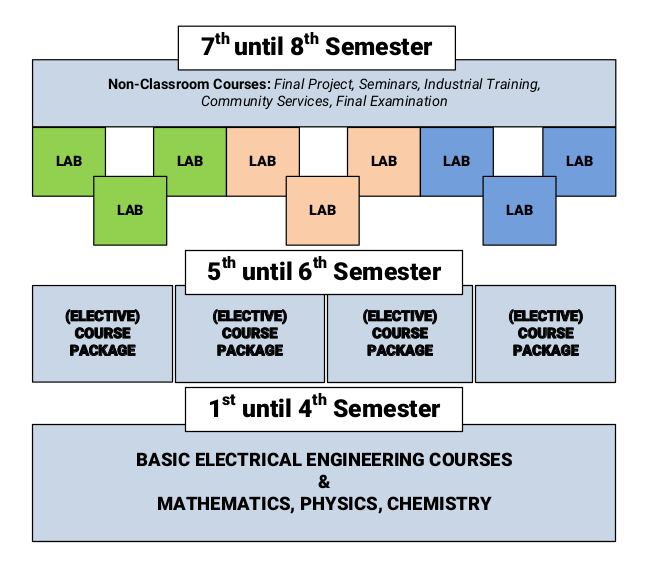
|  |  |
| --- | --- |
| Academic Year | Number of Graduates |
| 1975–2016 | 2525 |
| 2016–2017 | 83 |
| 2017–2018 | 107 |
| 2018–2019  2019-2020 | 52  59 |
| Total | 2826 |

Tale 2.1: The Selectivity of Five-Year Annual Admission Process.

|  |  |  |  |
| --- | --- | --- | --- |
| Academic  Year | Number of  Applicants | Admitted | Selectivity |
| 2019-2020  2018–2019 | 1382  2145 | 139  126 | 1:10  1:17 |
| 2017–2018 | 2282 | 101 | 1:23 |
| 2016–2017 | 2090 | 80 | 1:26 |
| 2015–2016 | 2524 | 116 | 1:22 |
| 2014–2015 | 2391 | 90 | 1:27 |
| Average | **2782** | **103** | **1:22** |

Table 2.2: The Annual Enrolment, Student Body and Graduates Fluctuation.

|  |  |  |  |
| --- | --- | --- | --- |
| Academic  Year | Enrolment | Student  Body | Graduates |
| 2019-2020  2018–2019 | 139  111 | 421  349 | 59  67 |
| 2017–2018 | 84 | 372 | 107 |
| 2016–2017 | 70 | 385 | 83 |
| 2015–2016 | 88 | 375 | 78 |
| 2014–2015 | 82 | 419 | 126 |



**Figure 1-1** The 2015 Curriculum Structure.

## Options

The main structure of the 2015 Curriculum is shown by Figure 1. In the first 4 (four) semesters, freshmen and sophomores spend most of their time in classrooms and supporting teaching laboratories to develop their knowledge on required mathematics and basic sciences (physics and chemistry), and the Electrical Engineering fundamentals, especially the 4 (four) basics namely[[1]](#footnote-1): (1) Electric Circuits, (2) Electro-magnetics, (3) Solid-state Electronics and (4) Digital Logic Circuits. They also begin to develop their skills to conduct simple experiments, to analyze, interpret and present data, to enhance their knowledge on the required subjects.

After completing all basic and fundamental courses, in the third year the students are supposed to take at least one elective-course package per semester consisting of 3 to 4 courses in a specific area of electrical engineering that will - but not necessarily – lead to one of the research laboratories or working groups in the fourth year that they are interested to apply. Roughly 6 to 8 elective-course packages are offered each semester to juniors, covering the total of more than 50 elective-courses.

Beginning in the fifth semester, a junior should make a decision to choose **at least one** of the following 5 (five) options by solicitedly selecting the related package of elective courses:

Option 1: Electrical Power Engineering and Electricity

Option 2: Telecommunication Engineering and Information Systems

Option 3: Computer Engineering and Robotics

Option 4: Control Systems and Instrumentation

Option 5: Electronic Engineering

The ultimate learning process is at the final fourth year. Seniors are required to apply to one of the research laboratories or working groups. When a senior is admitted to a research laboratory or working group then he or she becomes a member of the laboratory or group by signing an annual contract with the head of the laboratory or the chairman of the group. The seniors will work together with professors and their associates and assistants, their fellows graduate and undergraduate students, to develop their ability to apply their knowledge and to design experiments, systems, processes and/or components to meet desired needs. They also learn how to work effectively not only as individuals but also in teams, either as leaders or members.

**Table 1-2** List of Available Research Laboratories and Working Groups in the Academic Year of 2019-2020.

|  |  |
| --- | --- |
| **Area** | **Research Laboratories And Working Groups** |
| Electrical Power Engineering and Electricity | Electric Machines and Power Drives |
| Power System Stability, Control and Protection |
| Power Electronics |
| High Voltage and Insulation |
| Power System Distribution and Installation |
| Renewable Energy and Intelligent Systems |
| Energy and Power Systems |
| Electricity Infrastructures |
| Distributed Power Generation |
| Electricity Market and Power Systems |
| Telecommunication Engineering | Antenna And Wave Propagation |
| Radio Telecommunications and Microwave |
| Wireless Communication Technology |
| Transmission And Telecommunication Network |
| Radio Engineering |
| Multimedia Telecommunication and Artificial Intelligence |
| Telematics, Radar and Satellite |
| Computer And Robotics | Cognitive, Social and Intelligent Robotics |
| Computer Engineering and Network |
| Control Systems and Instrumentation | Control Systems and Instrumentation |
| Electronic Engineering | Electronics and Devices |

In the seventh semester, the students are expected to learn how to identify and formulate a problem, present it and propose a final project in a seminar to solve it. They should be able to define the scope of the problem so that they could complete the solution within months in the next eighth semester.

The final examination at the end of eighth semester is a special occasion to give an opportunity for graduating students to show their in-depth technical competence in at least one area of Electrical Engineering and to prove their academic contributions by demonstrating and defending their final undergraduate projects.

## Program Delivery Modes

The Faculty of Engineering officially runs all academic activities in working hours 07:00 AM to 05:00 PM Monday to Friday, 2 (two) semesters per academic year, 16 weeks per semester. Traditional or regular lecture courses are delivered during these working hours, while other activities, including non-lecture activities, may be delivered in these working hours or in the other time.

An EESP graduate must complete at least 145 credit hours of courses, a total of 28 credits hours equivalent of those are non-lecture courses, including:

1. The Undergraduate Final Project Report (called “*Skripsi*”), presented and defended in a Final Examination, 4 credit hours
2. Seminar on the Undergraduate Final Project Results, 2 credit hours
3. Seminar on the Undergraduate Final Project Proposal, 2 credit hours
4. Community Services (called “*Kuliah Kerja Nyata*” or *KKN*), an off-campus 1 month activity run by the university, usually in a remote area or a village, 4 credit hours
5. Practical (Industrial or “On Job”) Training, an off-campus 1 to 2 month activity, typically in an industrial site, 2 credit hours
6. Laboratory 1, an intra-laboratory or working-group R&D activity, semester 7, 8 credit hours, to develop an undergraduate final project proposal
7. Laboratory 2, an intra-laboratory or working-group R&D activity, semester 8, 8 credit hours, to produce a contribution from the undergraduate final project

The remaining 117 credit hours are delivered as regular lecture courses in classrooms supported by prescribed syllabii and text books, and/or by conducting experiments in the teaching laboratories: *Basic Physics Laboratory*, *Basic Electrical Engineering Laboratory* and *Computer Software Laboratory*.

## Program Locations

All academic teaching and learning processes are located in the new Faculty of Engineering campus at Gowa, about 20 km to the south from the old campus at Tamalanrea, Makassar. The new campus is designed to accommodate the concept of Laboratory-based Education (LBE) adopted by the Faculty of Engineering. Common facilities such as classrooms, the central library and the Faculty of Engineering administrative offices, are located in the main area of campus. A three-story building as seen in Figure 1-2 is functioned as the Classroom Building to house classrooms with the capacity of 20 to 100 students. Lecture theaters for an audience of hundreds of students are also available for general lectures. For smaller classes, less than 20 students, the seminar and meeting rooms in laboratories at the Electrical Engineering Building can be used, as shown in Fig. 1-3.



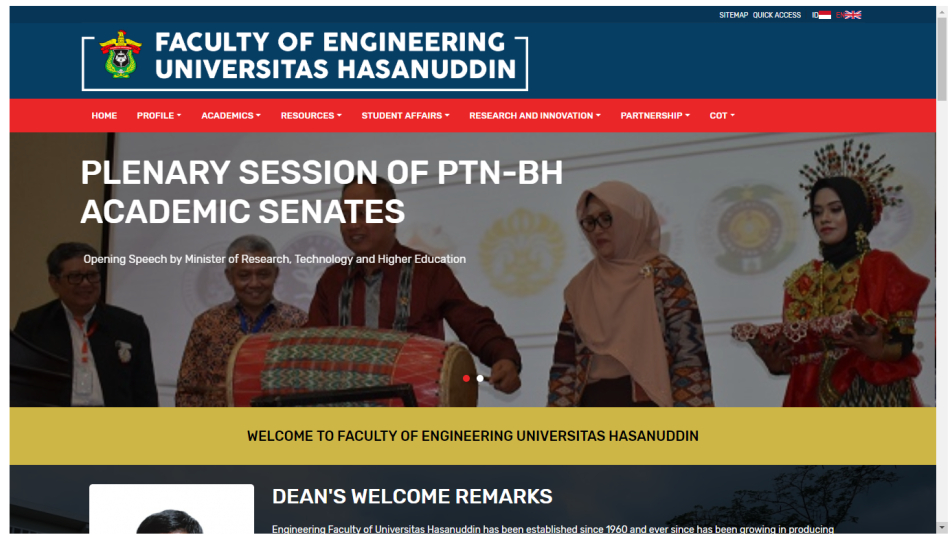
**Figure 2:** The EE Department Building.



**Figure 3:** The Standing Banners Around the Depatment's Administrative Office

## Public Disclosure

The information regarding the PEOs, SOs, annual student enrollment and graduation data, etc. is posted both on the standing banners in front of the Department's administrative office (see Fig. 3) and in the official website of the EESP (Please see Fig. 4): <http://eng.unhas.ac.id/electrical/> .



**Figure 4:** The Screen-Shot of the Front Page of the EESP Official Website.

## Deficiencies, Weaknesses or Concerns from Previous Evaluation(s) and the Actions Taken to Address Them

From ABET ENGINEERING ACCREDITATION COMMISSION FINAL STATEMENT based on the VISIT DATES of OCTOBER 23-25, 2019 for the ACCREDITATION CYCLE CRITERIA in the period of 2019-2020, the EESP was found as having 4 (four) Program Weaknesses: (1) Criterion 2: Program Educational Objectives, (2) Criterion 4: Continuous Improvement, (3) Criterion 5: Curriculum and (4) Criterion 7: Facilities.

The weakness (1) related to the Criterion 2: Program Educational Objectives has been resolved. The remaining 3 (three) weaknesses are being taken care of and expected to be **resolved before June 30 2021**.

More details regarding those 4 (four) weaknesses are stated by ABET-EAC as the following.

**1. Criterion 2: Program Educational Objectives**

This criterion requires the program to have published program educational objectives that are consistent with the mission of the institution, the needs of the program’s various constituencies, and the engineering accreditation criteria. It further requires that there be a documented, systematically utilized, and effective process, involving program constituents, for periodic review of these program educational objectives that ensures they remain consistent with the institutional mission, the program’s constituent’s needs, and the engineering accreditation criteria. The program lists its students, faculty members, industrial advisory board, major employers, and alumni as constituents. There was no evidence that any of these groups, aside from the faculty members, participated in the periodic review of program educational objectives. Without involvement of all constituencies in the process the program educational objectives may not meet the needs of the program’s constituents. Thus, the strength of

compliance with this criterion is lacking.

*30-Day Due-Process Response*

EAC acknowledges receiving documentation demonstrating that the program has involved all its constituents in the periodic review of program educational objectives through meetings seeking their review and input for improvement.

*Status*

**The program weakness has been resolved**.

**2. Criterion 4: Continuous Improvement**

This criterion requires that the program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. In fall 2018, the institution implemented a university- wide outcome-based assessment process. The program presented an assessment plan in which the seven student outcomes were mapped to courses in the curriculum, but the course instructional materials and student work did not always support the student outcomes identified to be assessed in the course. In addition, documentation of the materials and student work used to assess the level to which student outcomes were attained was incomplete. The assessment results were submitted to the university quality assurance office, but the use of the results as input to the continuous improvement of the program was not documented. Thus, the strength of compliance with this criterion is lacking.

*30-Day Due-Process Response*

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program states that it provided documentation of the materials and student work used to assess the level to which student outcomes were attained during the site visit. However, at the time of the visit, the team did not find those documents satisfactory, especially since very few of them were in English, and the faculty explanations were inadequate. Neither additional material nor explanation was provided in the 30-day response to demonstrate use of appropriate processes for assessing and evaluating student outcome attainment. A translated copy of the fall 2019 program faculty meeting report indicates that the faculty identified improvement steps to be taken in several courses but documentation has not been provided to indicate what and how the improvement steps have been implemented. There is no clear indication as to how outcomes assessment has improved, nor are there any data or indication of how the changes have led to systematic improvement of the program. Although some actions have been initiated, the review process and all assessment tools have not yet been fully developed and implemented. Thus, the strength of compliance with this criterion is lacking.

*Status*

The program weakness is unresolved. In preparation for the next review, the EAC anticipates receiving evidence in the form of documentation, that has been translated into English, indicating that an appropriate assessment process has been fully developed and implemented.

*Action Plan*

The PDCA (Plan-Do-Check-Action) 5 year assessment cycle for 2015 Curriculum will end this summer. The next PDCA cycle beginning in Fall 2021 for the new 2020 Curriculum will comply with the ABET and IABEE criteria. We are planning to improve our methods in measuring the student learning outcomes for each individual student, in addition to what we have done so far with each individual course. Selected courses will be categorized according to their contribution to the student learning outcomes. All lecturers of those selected courses will be required to create and to develop their own methods to make the best assessment of each individual student learning outcomes/

**3. Criterion 5: Curriculum**

This criterion requires that the program must include a culminating major engineering design experience that incorporates appropriate engineering standards and multiple constraints. The program has a capstone experience that is distributed over several courses. Appropriate engineering standards and multiple constraints were addressed indirectly in some senior design projects, but most project reports did not include evidence of the incorporation of engineering standards and constraints. Without adequate experience in the application of design constraints and engineering standards, students in the program may not be adequately prepared for engineering practice. Thus, the strength of compliance with this criterion is lacking.

*30-Day Due-Process Response*

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program has redesigned two existing design courses as capstone design courses to be taken in the final year of the curriculum. In the final projects students would be asked to incorporate engineering standards and design constraints, but revised syllabi have not been provided requiring this. Of the seven student project assignment statements provided, only one requires engineering standards and constraints to be considered; the other six assignments do not require such considerations. Thus, the strength of compliance with this criterion is lacking.

*Status*

The program weakness is unresolved. In preparation for next review, the EAC anticipates documentation, in English, demonstrating the capstone design courses incorporate appropriate design constraints and engineering standards.

*Action Plan*

The term “*capstone design*” was only known to the EESP faculty in 2018 when the ABET accreditation process began. Some efforts to turn the orientation of the learning process from the *R&D-based 2015 Curriculum* toward more *design-based* have been implemented since 2019 when the curriculum itself almost ended. One of these efforts included the integration of R&D activities in several laborotories into a rather large scale “*capstone-design*” project. In the new 2020 Curriculum (will be implemented in Fall 2021), the R&D-oriented courses *Laboratory 1* (8 credit-hours) dan *Laboratory 2* (8 credit-hours) from the previous curriculum are to be replaced by design-courses of *Electrical Engineering Design 1* (4 credit-hours) and *Electrical Engineering Design 2* (4 credit-hours) consecutively, that are more design-oriented. However, it must be underlined that the R&D activities in the research laboratories have become the ultimate learning process to implement all knowledges and skills attained in the previous courses.

**4. Criterion 7: Facilities**

This criterion requires that classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, accessible, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. The program has facilities to support attainment of students outcomes, but in some cases the number of students using the facility was large, such that each student may not receive the full benefit of the experience. In addition, the limited functionality of student versions of software for electrical circuit simulation, numerical computation and general office functions impeded the ability of students to fully attain the student outcomes. Without sufficient and appropriate equipment and software, student learning through hands- on laboratory experience may be inadequate. Thus, strength of compliance with this criterion is lacking.

*30-Day Due-Process Response*

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program has initiated procurement of a professional edition of a numerical simulation program and full version of an electric and electronic circuit simulator, as well as backup units of the lab equipment. No evidence was provided of the actual purchase and installation of the software and equipment. Thus, strength of compliance with this criterion is lacking.

*Status*

The program weakness is unresolved. In preparation for next review, the EAC anticipates translated documentation indicating that the software and equipment needed for students to attain the learning outcomes have been obtained.

*Action Plan*

The procurement process of software and equipment is taken care of at the university level by the directorate under the Bureau of General Administration. All expenditures are planned a year ahead in the annual budgeting process. We are anticipating all necessary procurement will be completed by June 30 2021.

**GENERAL CRITERIA**

# CRITERION 1. STUDENTS

## Student Admissions

To apply for admission, a prospective new student should have been graduated from the high school within the previous 3 years indicated by passing the National Exam (Ujian Nasional) at the grade 12 level. The process of admission is held at the university level from May to June in every academic year. Prospective students are assessed for their academic potential using a standard scholastic potential test, and another academic competency test covering mathematics, physics, chemistry and biology.

The university sets the admission quota for the EESP, and then allows the proportion of the admitted number of students by applying the following schemes:

* + 1. Minimum 20% of the quota are admitted through the SNMPTN, a standard national selection process carried out by inviting prospective high school graduates who are eligible for this process. A newly founded national institute called the LTMPTN under the Ministry of Research, Technology and Higher Education carries-out this selection process.
    2. Minimum 50% of the quota are admitted through the SBMPTN, the National Admission Selection for Public University, held also by the LTMPTN. The applicants should take a nationally carried out computer-based entrance examination.
    3. Maximum 30% of the quota are admitted through a university held selection process based on various criteria.

## Evaluating Student Performance

**Not yet submitted** submit for Readiness Review.

## Transfer Students and Transfer Courses

In the recent years no transfer students have been admitted and no transfer course from other institution is available.

## Advising and Career Guidance

Faculty members also serve as academic advisors whose main function is to provide students recommendations in selecting courses prior to registering for the next semester. These recommendations include the strategy to select courses related to prospective jobs after graduation.

EESP carries out academic dialogues regularly to obtain inputs and to find solutions for students’ obstacles in the study process. Moreover, these academic dialogues discuss employment opportunities for graduating students. Periodically, once or twice a year, the EESP also invites some members of the alumni association (IATEL) or other external parties to make presentations on any new information in the real world, especially up-dated information on jobs and other opportunities.

The curriculum also requires students to take courses on entrepreneurship to urge them to become creative graduates who are not merely job-seeking, but also job- creating graduates. “The best way to predict your future is to create it” [Abraham Lincoln]. The EESP expects its alumni to be able to create jobs at least for themselves, and for others is possible

At the Faculty of Engineering level (supervised by the Vice Dean for Students and Alumni Affairs) and at the university level (coordinated by the Directorate of Alumni and Career Preparation) special occasions such as job-fairs are held regularly for students and alumni.

## Work in Lieu of Courses

Basically the EESP does not implement the requirements and process for awarding credit hours for work in lieu of courses. However, the curriculum requires students to take 2 (two) courses delivered “Off Campus”, namely (1) Community Services (called “*Kuliah Kerja Nyata*” or KKN), an off-campus 1 month activity run by the university, usually in a remote area or a village for 4 credit hours and (2) Practical (Industrial or “On Job”) Training, an off-campus 1 to 2 month activity, typically in an industrial site for 2 credit hours.

Those two “Off Campus” Courses give the students real world experiences. The Practical (Industrial or “On Job”) Training, called “*Kerja Praktek*” or KP, may lead to a long term (6 months) internship program if the corporate management thinks it necessary, or in some cases the student could develop his or her final undergraduate project as an extended version of his or her KP report.

## Graduation Requirements

At the Commencement Day, the degree of “*Sarjana Teknik* (S.T.)” - equivalent to BS degree in the US - is conferred upon a graduate together with all honors, rights and privileges belonging to that degree. It means that the graduate has completed at least 147 credit hours of courses, a total of 30 credit hours equivalent of those are Non-Lecture Courses, with a cumulative GPA or IPK no less than 2.00 out of 4.00.

The end stage of the study program is the Undergraduate Final Examination. This is an oral examination, held for an hour or two, attended only by 4 (four) instructors: two of them are the co-supervisors of the student’s Undergraduate Final Project, and the other two act as the examiners. This Undergraduate Final Examination mainly serves as a comprehensive examination to measure the student’s competency in the field. In this examination, the student should also present and defend his or her Undergraduate Final Project Report, called *Skripsi* (4 credit hours). As the pre-requisite, prior to the Undergraduate Final Examination, the students should complete at least 143 credit hours of courses composed of the following courses:

1. Non-Lecture Courses: Laboratory 1 (8 credit-hours), Laboratory 2 (8 credit- hours), KKN (4 credit-hours), KP (2 credit-hours), Seminar on Proposal (2 credit-hours) and Seminar on Results (2 credit-hours), Final Project Report (4 credit-hours), total: 30 credit-hours.
2. General Education Courses, total: 14 credit-hours
3. Mathematics, total: 18 credit-hours
4. Sciences, total: 16 credit-hours
5. Electrical Engineering Cores (obligatory), total: 49 credit-hours
6. Electrical Engineering Breadth (elective), minimum: 18 credit-hours
7. Electrical Engineering Technical/Depth (elective), minimum: 2 credit-hours

Other graduation requirements also include several administrative and financial terms such as the payment of tuition fee, the submission of corrected and completed copies of *Skripsi*, clearances from laboratories and libraries, etc.

## Transcripts of Recent Graduates

An example of a recent graduate’s academic transcript, a copy of graduation certificate and academic progress report can be found in the attachments. The academic transcript shows the personal information of the graduated students (such as the birth date, place and his or her student ID number), the list of all completed courses with all their grades converted to the cumulative GPA, the final GPA, the graduation predicate and also the title of the *Skripsi*. The chronological history of the student performance can be seen on the student study results by mean academic progress report each semester.

# CRITERION 2. PROGRAM EDUCATIONAL OBJECTIVES

## Mission Statement

**Not yet submitted** for Readiness Review.

## Program Educational Objectives

The EESP’s Program Educational Objectives (PEO) are established according to systematic mechanism shown in Figure 2-1. The main reference of this process of establishment is the national mission statements of the higher-education system in Indonesia, which was translated into the vision of Universitas Hasanuddin, missions and values, as stated in the Statute of Universitas Hasanuddin, PP Number 53/2015, which is a legal document issued by the Government of Indonesia as a government regulation. The Faculty of Engineering derived its mission statements (consists of vision, missions and goals) from the university mission statements and documented them in a “strategic plan” (called RENSTRA 2016-2020) validated and legalized by the Senate of the Faculty of Engineering.

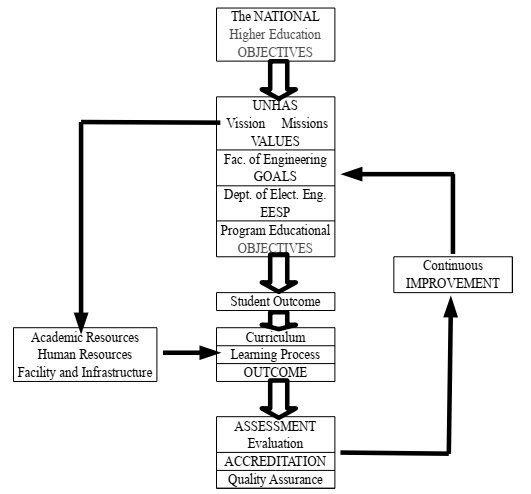


Figure 2-1: Systematic Derivation of National Higher Education Objectives into the EESP’s PEOs.

Referring to the university’s and Faculty of Engineering’s mission statements, then the EESP staff formulated the EESP’s mission statements also consisting of its vision, missions and goals, to further derive the Program Educational Objectives as presented in Table 2.1.

1. The EESP graduates should have a mastery in basic sciences and mathematics relevant to the basic competency in the field of electrical engineering (*Basic Science Skills*)
2. The EESP graduates should have an ability to anticipate, to formulate and to solve problems related to the field of electrical engineering (*Professional Skills*)
3. The EESP graduates should have the spirit of leadership and entrepreneurship, the academic attitude, and should have an ability to compete to work in various sectors all over the world, especially in Indonesia and Asia-Pacific region (*Entrepreneur Skills*)
4. The EESP graduates should have a capability to continue their study to the higher degree of education all over the world (*Research Skills*)

Table 2.1: The EESP Program Educational Objective (PEOs).

|  |  |
| --- | --- |
| **PEO Label** | **Program Educational Objective:** |
| **PEO-1** | The EESP graduates have a mastery in basic sciences and mathematics relevant to the basic competency in the field of electrical engineering (Basic Science Skills) |
| **PEO-2** | The EESP graduates have an ability to anticipate, to formulate and to solve problems related to the field of electrical engineering (Professional Skills) |
| **PEO-3** | The EESP graduates have the spirit of leadership and entrepreneurship, the academic attitude, and have an ability to compete to work in various sectors all over the world, especially in Indonesia and Asia-Pacific region (Entrepreneur Skills) |
| **PEO-4** | The EESP graduates have capability to continue their study to higher degree of education all over the world (Research Skills) |

These Program Educational Objectives are posted in the official website of the Department and also shown to visitors on standing banners in front of the Department’s administrative office.

## Consistency of the Program Educational Objectives with the Mission of the Institution

**Not yet submitted** for Readiness Review.

## Program Constituencies

Basically there are two categories of constituencies: the “internal” constituency and the “external” constituency. Both are considered very important in the process for establishing the Program Educational Objectives (PEO), so that the EESP regards them as its “stakeholders”.

The “internal” constituency - commonly called the civitas academica - includes students and all faculty members. The supporting staffs, both laboratory technicians and administrative staff, are also parts of the “internal” constituency. The students are the beneficiaries of the programs served by the rest of the “internal” constituency. There- fore the whole “internal” constituency should make their best efforts to maintain the conducive academic atmosphere for the sake of the students’ interests. The university has announced that all study programs should implement the what so called “Student Centered Learning” (SCL) environment to focus on the students’ best interests.

Periodically, the EESP calls for an “academic dialogue” to get feedback from students regarding all academic matters and obstacles.

At the time of what so called the era of “disruption”, the era of the emergence of entirely new kinds of businesses like Uber and Airbnb, it is almost impossible to predict, who or what will be the EESP’s main “external” constituency in the future when the graduates start to enter the job market. Therefore, it is important to strengthen the basics, especially mathematics, basic sciences and basic electrical engineering, and the spirit of entrepreneurship that will give the graduates a strong self-confidence to face the new challenging world, and then successfully create jobs at least for themselves, and also for others.

Relying merely on the traditional “external” constituencies such as the state-owned enterprises in electrical power systems and electricity, telecommunication, general contractors and consultants, etc., has a potential to leave the graduates irrelevant in the future which is more dangerous than becoming out of job. The issue of relevance is the most important factor to be considered when stating the Program Educational Objectives above. The closest “external” constituency to hear from includes the students’ parents, alumni and their employers. For the students’ parents there is an association at the university level (IOM-UNHAS) while for the alumni there is a large organization at the university level (IKA-UNHAS) as well as the smaller one at the EESP level (IATEL-UNHAS). The social-media is very effective in gathering all information, updates and feedback from the “external” constituencies.

In order to strengthen and to enhance the communication between the “internal” and “external” constituencies, and among themselves, the EESP has established an Advisory Board as seen in Table 2.2. The Advisory Board is supposed to represent the constituency, both “external” and “internal”, and is also expected to have a regular meeting to discuss the grand strategy to achieve the realization of the Program Educational Objectives by implementing the curriculum.

Table 2.2: Member of Advisory Board

|  |  |  |  |
| --- | --- | --- | --- |
| No | Name | Occupation | Entity |
| 1 | Abdul Salam | Operational Manager | PT. PLN (PERSERO) UIP  SULBAGSEL |
| 2 | Irwan Thamrin Tantu | Managing Partner, President Director Senior SCADA Advisor | tQ Automation, LLC  tQ TantuTech, DBA Wartsila, Inc. ESS Unit |
| 3 | Otis Kafiar | General Foreman Field Project Engineer Electrical | PT. Freeport Indonesia |
| 4 | Haris | Director of Renewable Energy | Ministry of Mineral, and Energy  Resources |
| 5 | Bambang Yusuf | General Manager | PT. PLN (Persero) UIW  SULSELRABAR |
| 6 | Syarifuddin Nojeng | Vice Dean of Academic | Faculty of Engineering UMI |
| 7 | Muammar Muhayyang | Manager Thermo Power Plant  Operation | PT. Vale Indonesia Tbk |
| 8 | Makkasau | Electricity consultant | Consultant |
| 9 | Samuel Parura | Senior Manager Resident  Engineering | PT. Pertamina |
| 10 | Jaizuludin Mahmud | General Manager | PT. PLN (Persero) UIW  SULSELRABAR |
| 11 | A. Rahman | Marketing Manager | PT. LEN Industri |
| 12 | Iwan Soma BSB | Electronic Coordinator | PT. Bumi Sarana Beton |
| 13 | Nuryadin Salam | General Manager | PT. TELKOM |
| 14 | Maragusti Harahap | Chairman of the Electrical Engineering Alumni Association | Consultant |

## Process for Review of the Program Educational Objectives

The EESP curriculum is subject to be reviewed periodically every five years since 1995. The process for review usually begins with a tracer study by surveying the alumnus’s well-being and their views on the curriculum after they leave campus all that long. The alumnus’s points of view are the most important consideration in the development of new curriculum. In the last tracer study in 2013, the alumni were asked what courses that they still remember after graduation. The alumnus’s strong memory on specific courses indicates how important the courses are for them now, or how good the courses were delivered during their tenure as students in previous years. The tracer study in 2013, 50 years after its establishment in 1963, was aimed to build a strong foundation for a major change of curriculum in 2015, when the EESP planned to move to the entirely new campus.

There were two major recommendations derived from the analysis on the results of 2013 tracer study: (1) all basic (mathematics, physics, chemistry, electrical engineering) courses should be strengthen and their materials and methods of delivery should be continuously developed and updated, and (2) all advanced electrical engineering courses should be completed in the 4th, 5th and 6th semesters, all are delivered to develop the students’ competency in the field of electrical engineering based on their own preferences and interests, so that they are well prepared and capable to make some sort of contribution when they work in the laboratories in the 7th and 8th semesters.

The purpose of reviewing of the Program Educational Objectives periodically is to maintain the continuous improvement of the study program. There are two processes of review: (1) a direct review on the learning process at the course level by updating the course profiles and evaluating the student outcomes, and (2) an indirect review based on surveys, including the tracer study (alumni surveys and the employer survey) and the exit survey before the graduation day.

The indirect review process covers two kinds of activities: (1) the senior exit survey and (2) the tracer study. The senior exit survey is carried out before the commencement. Universitas Hasanuddin holds 4 periods of graduation in a year: the period of March, June, September and December.

The tracer study involves two groups of respondents: (1) the alumni and (2) the employers of the alumni.

We have made meetings with all constituencies discussing about the reviews of the EESP program educational objectives and the review of the student outcome achievements

# CRITERION 3. STUDENT OUTCOMES

## Student Outcomes

The EESP evaluates its program educational objectives based on seven Student Out- comes (SO), which are presented in Table 3.1. Each SO has a label as presented in the table.

Table 3.1: The EESP Student Outcomes.

|  |  |
| --- | --- |
| **SO Label** | **Student Outcome:** |
| **SO-1** | An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics |
| **SO-2** | An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors |
| **SO-3** | An ability to communicate effectively with a range of audiences |
| **SO-4** | An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must con- sider the impact of engineering solutions in global, economic, environ- mental, and societal contexts |
| **SO-5** | An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives |
| **SO-6** | An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions |
| **SO-7** | An ability to acquire and apply new knowledge (contribution) as needed, using appropriate learning strategies |

By participating in various academic programs in EESP, the students will attain the basic competency in the field of electrical engineering, and at least one of the following options:

*Option 1: Electricity and Electrical Power Engineering*

* **OP1(a)**: An ability to design and to analyze electricity systems both technically and economically
* **OP1(b)**: A mastery in power system generation, installation, transmission and distribution, and power station operation

*Option 2: Telecommunication and Information System*

* **OP2(a)**: A mastery in system management and control of network, hardware and multimedia software applications in telecommunication and information systems
* **OP2(b)**: An ability to anticipate, to formulate and to solve problems related to the network, hardware and multimedia software applications in telecommunica- tion and information systems
* **OP2(c)**: An ability to participate in the science and technology development, especially in the area of telecommunication and information systems, and always being adaptive to the advancement of science and technology in this area

*Option 3: Computer Engineering and Robotics*

* **OP3(a)**: An ability to utilize the computer software packages for modeling and simulation of various electrical engineering problems
* **OP3(b)**: A mastery in concepts, design and application of the digital computer hardware particularly for robotic applications

*Option 4: Control Engineering*

* **OP4(a)**: A mastery in the basic control theory, both classical and modern control theory, and its application in the control systems analysis and design

*Option 5: Electronic Engineering*

* **OP5(a)**: A mastery on the know-how to design electronic circuits and systems by using electronic devices, including the utilization of software packages
* **OP5(b)**: A mastery on the know-how to design integrated circuits or micro- electronics circuit, including the utilization of software packages for integrated circuit layout and design

The aforementioned optional student outcomes of the EESP have been implicitly represented by the EESP Student Outcomes. They have strong relationship with the Student Outcomes SO-1, SO-2, SO-6 and SO-7. The optional student outcomes can be mapped also to the other EESP Student Outcome, however, the relationships are relatively weak.

## Relationship of Student Outcomes to Program Educational Objectives

**Not yet submitted** for Readiness Review.

# CRITERION 4. CONTINUOUS IMPROVEMENT

The EESP assesses regularly and evaluate the extent to which the student outcomes have been attained. The assessment of the student outcome is generally divided into two methods, i.e. direct and indirect assessment method. The descriptions of the methods are given as follows.

**Direct Assessment.**

In general the direct assessment method is made during study period, which is divided into two main parts, i.e.:

1. Examinations, which are divided into:
   1. Course exams. These exams are part of grading systems of student’s works in each course.
   2. Lab exams, These exams are part of grading systems of student’s work in each lab work.
   3. Final examination bundled in an Undergraduate Final project presentations.
2. Student’s Outcomes Portfolios. Besides the student’s grades for all courses, which are presented in student’s transcript after finishing their study, every student is also encourage to enrich his/her portfolio. The student’s portfolio is described concretely in a single or multiple papers. Different with student’s transcript that gives student performance in quantitative grading points, the student portfolio describes the student skills achievement qualitative description. The student portfolio states the student experiences in design contests or competitions, in national and/or international conferences as presenter or passive participant, including their achievements in those events, obtained awards or honors, etc.

In the first semester, each student is given a skill map (single paper), presenting some skills that the student wish or expect to master after completing his/her BSEE degree. Each student can select until 3-5 skills with a given priority number. The given skills are stated for example that “he/she will be able to design a component of an electric vehicle”. It is not necessary that the given skills sound similar with the student outcomes, but they can implicitly represent or reflect at least one of the student outcomes. The EESP collects then the skill map signed by the student, and let the student keep a copy for his/her archive. In the last Semester, this skills map is opened again and the student expectations shown in the skills map are cross checked with the student portfolio that he/she will have made upon completing his/her BSEE study.

During their study-period, the student outcomes will be assessed. Four skills are given to students in accordance with the program educational objectives of the EESP (Criterion 3), i.e. basic science skills, professional skills, entrepreneur skills and research skills. The student outcomes related to their technical knowledge (professional skills) to solve an engineering problem can be achieved after Semester 6 (third year). Therefore, the professional skills can be measured after the third year. The research skills of a student can be assessed in the last semester (Semester 8) during completing his/her undergraduate final project. Extensive advising is given by the project supervisor including the scientific writing.

At least once a year or once per semester, the EESP opens a local student conference and exhibition (SCE). In the SCE, some students will have chance to demonstrate their communication or presentation skill, to show their scientific writing skill, and to expose their undergraduate projects. All students, teaching staff, government representatives and the parents and/or family members of the student will be invited to attend the SCE.

**Indirect Assessment.**

The EESP indirect assessment is divided into three methods, i.e.:

* 1. Senior Exit Surveys
  2. Alumni Surveys using google form or an existing social media (LinkedIn as our preference)
  3. Employer Surveys through a purpose sampling industrial advisory committee meetings

The indirect method is made to know the extent to which: 1) a fresh graduate satisfies with the EESP curriculum, through the Senior Exit Surveys, 2) the employers satisfies with the performance of our alumni, through the purpose sampling industrial advisory committee meeting, and 3) the existences of our alumni that have established their own company. Point 2) above is related to both, the Alumni and Employer Surveys, while Point 3) is related to the Alumni Surveys.

To gather the data of our alumni, every fresh graduate is asked to register on a social media. In this case, we select LinkedIn as our preference. The fresh graduated alumni is asked to link his/her account to the EESP alumni account and continuously update their last employment status. The EESP will then collect the alumni data from the social media and put them in the EESP alumni database.

At least once a year, the EESP selects or samples an employer to host an industrial advisory committee meeting. The industrial advisory committee are the EESP staff and staff from industries or employers in which the EESP Alumni are employed. The committee will discuss about the industrial needs and how the EESP Alumni can meet the requirements.

## Student Outcomes

Table 4-1 presents a Skill-Assessment Map or listing of skills related to the program education objectives, which are assessed with the direct and indirect assessment methods. The complete student outcomes have been presented in Criterion 3, Section A. The EESP uses the ABET’s Engineering and Electrical Engineering Criteria as well as at least of the options study in the EESP.

The student outcomes are the reflection of four program educational objectives of the EESP, presented in Criterion 2 Section B. The program educational objectives are termed as Competency Skills, Professional Skills, Entrepreneur Skills and Research Skills. The assessed skills of each student is reported in the student outcome portfolio.

**Table 4-1 Skill-Assessment map**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ver. 1.0 | Assessment/Evaluation Methods | | | | | | | | | | | | | | | |
| EESP Program Outcome | Indirect | | | Direct | | | | | | | | | | | | |
| Senior Exit Surveys | Alumni Surveys | Employer Surveys | Math, Physics exams | Advanced Math, Physisc, Linear Systems exams | Numerical methods, comp. progr. exams | Basic electronics, telec, power eng. Exams | Env. sciences, Princ. of Maritime science exams | Dig. Sys, Electric, Electronics Labs | Integrated Electronics, Microprocessors Labs | Selected Elective course exams | Engineering Economics, Entrepreneurship exams | Concepts of Sci, Techn. & Arts, maritime cult.exams | Lab Works exams, Practical (on-ob) training | Research Method and Scientific Writing exams | Final Examination |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| **Competency Skills** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Math., science skills | x | x | x | x |  |  |  |  |  |  |  |  |  |  |  |  |
| Problem Modeling | x | x | x |  | x | x |  |  |  |  |  |  |  |  |  |  |
| Analytical Skills | x | x | x |  |  | x | x |  |  |  |  |  |  |  |  |  |
| Critical thinking | x | x | x |  |  |  |  | x |  |  |  |  |  |  |  |  |
| **Professional Skills** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Software Tools | x | x | x |  |  |  | x |  | x | x | x |  |  |  |  |  |
| Design Skills | x | x | x |  |  |  |  |  | x | x | x |  |  |  |  |  |
| Experiment Skills | x | x | x |  |  |  |  |  | x | x | x |  |  |  |  |  |
| Engineering Knowhow | x | x | x |  |  |  |  |  | x | x | x |  |  |  |  |  |
| **Entrepreneur Skills** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Innovations | x | x | x |  |  |  |  |  |  |  | x |  |  |  |  |  |
| Leadership | x | x | x |  |  |  |  |  |  |  |  | x |  |  |  |  |
| Entrepreneurship | x | x | x |  |  |  |  |  |  |  |  | x |  |  |  |  |
| Global Insights | x | x | x |  |  |  |  |  |  |  |  |  | x |  |  |  |
| **Research Skills** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Teamwork skills | x | x | x |  |  |  |  |  |  |  |  |  |  | x |  |  |
| Scientific Writing | x | x | x |  |  |  |  |  |  |  |  |  |  |  | x |  |
| Presentation Skiils | x | x | x |  |  |  |  |  |  |  |  |  |  |  |  | x |

## Continuous Improvement

As inputs in the continuous improvement of the EESP student’s outcomes, the EESP will collect data from the direct and indirect assessments explained in Section A. The collected data are analyzed and used as the references to evaluate the EESP curriculum and to improve the student outcome achievements. The students outcomes of each graduate reflected in the student portfolios are documented in a database.

The 2015 Curriculum assessment process is currently only at the last stage of one PDCA cycle. The assessment process for the next PDCA cycle will begin with the implementation of the 2020 Curriculum which has been adjusted to the ABET and IABEE criteria. The process of improvement and the selection of the provisional assessment method was carried out by completing the student portfolio.

The assessment was carried out by grouping subjects with the same CPL and selected based on special considerations, especially their importance in supporting student CPL. Each course will have its priority weight which we will adjust based on the consideration of the potential contribution of the course to the student's CPL.

The conversion of the average final score of students in a course is a parameter (numbers) that will be used in measuring the level of CPL achievement. Then an assessment rubric is made as a guide for each lecturer to provide a final score strictly for each student, so that the student's CPL is well measured.

Currently, the assessment method is being improved so that in the future the results of the evaluation that propose corrective action will be valid and the improvement of learning processes and resources will be effective.

## Additional Information

**Not yet submitted** for Readiness Review.

# CRITERION 5. CURRICULUM

## Program Curriculum

The Program Curriculum of the EESP is designed to meet the program educational objectives.

The EESP requires that all educational programs must have a freshman year that consists of mathematics and basic science, a set of general education, and engineering topics. With these constraints, the implementation of the EESP curriculum consists of three elements and with a total minimum of 147 credits hours as shown in the Figure 5-1.

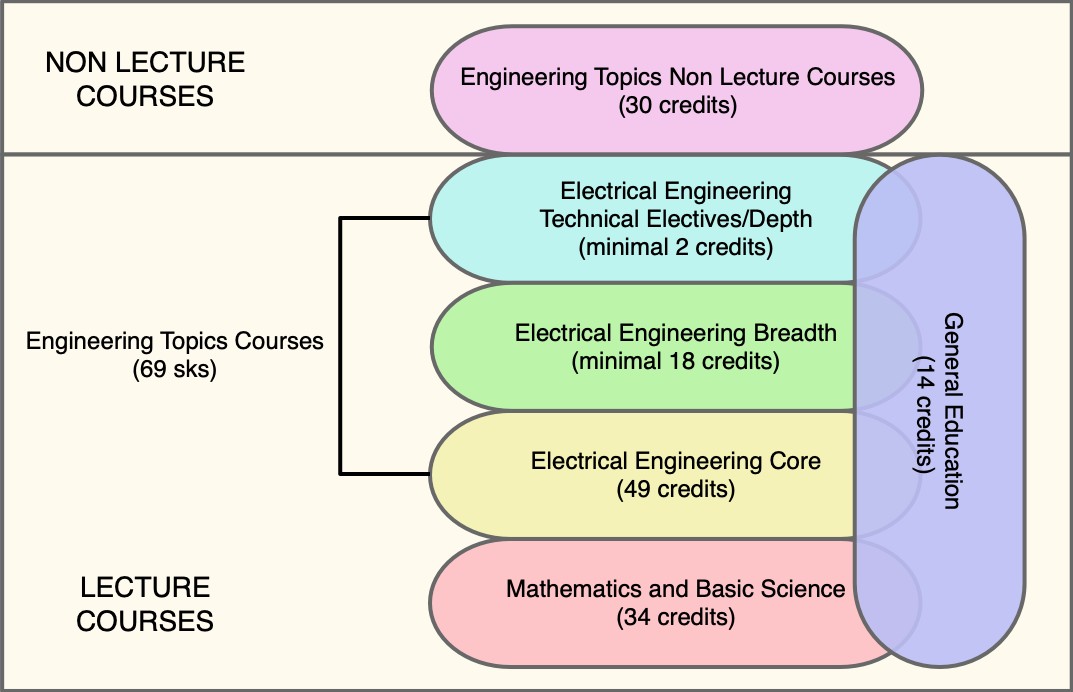
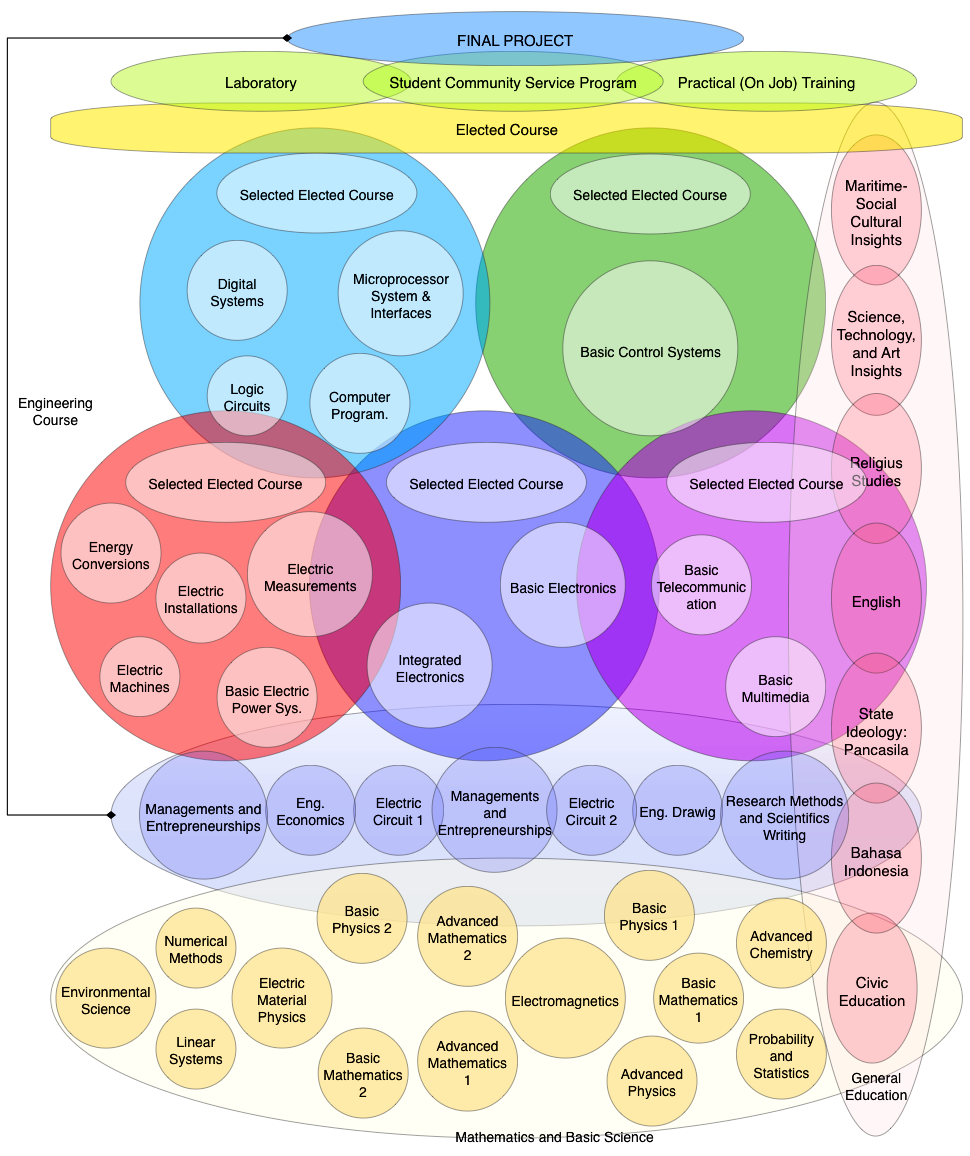


Figure 5.1 Overview of EESP curriculum.

Table 5-1 describes the plan of study for students in this program including information on course offerings in the form of a recommended schedule by year and term along with maximum section enrollments for all courses in the program.

The flowchart or worksheet that illustrates the prerequisite structure of the program’s required courses is shown in Figure 5-2.



**Figure 5-2** Flowchart or worksheet that illustrates the prerequisite structure of the program.

The 2015 curriculum was designed as an R&D-based curriculum to implement the LBE required by JICA when providing loans for the construction of the Engineering Faculty Campus in Gowa. The term “capstone design” was only known in 2018 when the Study Program was accredited by ABET.

Efforts to change the orientation of the curriculum from R & D-based to design-based were only made after the Study Program was accredited by ABET at the end of the 2015 Curriculum, among others by integrating R&D activities in several labs under an umbrella " capstone-design ”project. However, it needs to be underlined that some of the outputs from the student R&D lab activities have also produced outputs in the form of prototypes of tools that can be made by students as an accumulation of knowledge and expertise gained from various subjects.

Engineering design (which considers engineering standards and realistic constraints afterwards includes defining problems, developing alternative solutions, selecting the best alternatives, implementing solutions, evaluating and validating solutions to problem boundaries) while reviewing and making SOPs at the Study Program level so that there is uniformity of implementation in each laboratory.

## Course Syllabi

The Course Syllabi can be found in Appendix A of this Readiness Review Report.

## Table 5-1 Curriculum

**Electrical Engineering Study Program**

| ***Course  Electrical Engineering*** | ***Required, Elective, or a Selected Elective*** | ***Subject Area (Credit Hours)*** | | | | ***Last Two Terms the Course was Offered: Year and Semester or Quarter*** | ***Maximum Section Enrollment for The Last Two Terms the Course was Offered*** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Math & Basic Sciences*** | ***Engineering Topics Check If Contains Significant Design ()*** | ***General Education*** | ***Other*** |
| **Lecture Courses** | | | | | | | |
| *011U0032 Civic Education* | R |  |  | 2 |  | I; 1 | 84 |
| *009U0032 Bahasa Indonesia* | R |  |  | 2 |  | I; 1 | 84 |
| *016U0033 Calculus 1* | R | 3 |  |  |  | I; 1 | 100 |
| *020U0033 Physics 1* | R | 3 |  |  |  | I; 1 | 100 |
| *101D4113 Electrical Circuits 1* | R |  | 3 |  |  | I; 1 | 100 |
| *102D4112 Logic Circuits* | R |  | 2 |  |  | I; 1 | 100 |
| *103D4112 Engineering Drawing* | R |  | 2 |  |  | I; 1 | 100 |
| *104D4112 Advanced Chemistry* | R | 2 |  |  |  | I; 1 | 100 |
| *001U0032 Religious Studies (Islam, Catholic, etc)* | R |  |  | 2 |  | I; 2 | 84 |
| *012U0032 State Ideology: Pancasila* | R |  |  | 2 |  | I; 2 | 84 |
| *010U0032 English* | R |  |  | 2 |  | I; 2 | 84 |
| *017U0033 Calculus 2* | R | 3 |  |  |  | I; 2 | 100 |
| *022U0033 Physics 2* | R | 3 |  |  |  | I; 2 | 90 |
| *105D4123 Electric Circuits 2* | R |  | 3 |  |  | I; 2 | 90 |
| *106D4122 Digital Systems* | R |  | 2 |  |  | I; 2 | 100 |
| *107D4122 Computer Programming* | R |  | 2 |  |  | I; 2 | 95 |
| *108D4121 Electric Circuits Laboratory* | R |  | 1 |  |  | I; 2 | 100 |
| *109D4121 Digital Systems Laboratory* | R |  | 1 |  |  | I; 2 | 95 |
| *008U0032 Principle of Science, Technology, and Art* | R |  |  | 2 |  | II;3 | 70 |
| *201D4113 Advanced Mathematics 1* | R | 3 |  |  |  | II;3 | 85 |
| *202D4112 Basic Electric Power (Systems)* | R |  | 2 |  |  | II;3 | 70 |
| *203D4112 Basic Telecommunication (Systems)* | R |  | 2 |  |  | II;3 | 85 |
| *204D4112 Basic Electronics* | R |  | 2 |  |  | II;3 | 85 |
| *205D4112 Electric Material Physics* | R | 2 |  |  |  | II;3 | 70 |
| *206D4112 Advanced Physics* | R | 2 |  |  |  | II;3 | 85 |
| *207D4111 Basic Electric Power laboratory* | R |  | 1 |  |  | II;3 | 85 |
| *208D4111 Basic Telecommunication Laboratory* | R |  | 1 |  |  | II;3 | 85 |
| *209D4111 Basic Electronics Laboratory* | R |  | 1 |  |  | II;3 | 85 |
| *007U0032 Principle of Maritime Science* | R |  |  | 2 |  | II;4 | 70 |
| *210D4123 Advanced Mathematics 2* | R | 3 |  |  |  | II;4 | 85 |
| *211D4122 Linear Systems* | R | 2 |  |  |  | II;4 | 85 |
| *212D4122 Electric Machines* | R |  | 2 |  |  | II;4 | 70 |
| *213D4122 Basic Multimedia* | R |  | 2 |  |  | II;4 | 70 |
| *214D4122 Integrated Electronics* | R |  | 2 |  |  | II;4 | 85 |
| *215D4122 Microprocessor Systems and Interfaces* | R |  | 2 |  |  | II;4 | 85 |
| *216D4122 Basic Control Systems* | R |  | 2 |  |  | II;4 | 70 |
| *217D4122 Electric Installation and Laboratory* | R |  | 2 |  |  | II;4 | 85 |
| *218D4121 Integrated Electronics Laboratory* | R |  | 1 |  |  | II;4 | 85 |
| *219D4121 Microprocessor Systems and Interfaces Laboratory* | R |  | 1 |  |  | II;4 | 85 |
| *301D4112 Engineering Economics* | R |  | 2 |  |  | III;5 |  |
| *302D4112 Probability and Statistics* | R | 2 |  |  |  | III;5 |  |
| *303D4112 Electric Measurement* | R |  | 2 |  |  | III;5 |  |
| *304D4112 Electromagnetics* | R | 2 |  |  |  | III;5 |  |
| *Selected Elective Course (1 Package)\** | SE |  | 9 |  |  | III;5 |  |
| *342D4122 Numerical Methods* | R | 2 |  |  |  | III;6 |  |
| *343D4122 Energy Conversion* | R |  | 2 |  |  | III;6 |  |
| *344D4122 Environmental Science* | R | 2 |  |  |  | III;6 |  |
| *345D4122 Management and Entrepreneurship* | R |  | 2 |  |  | III;6 |  |
| *Selected Elective Course (1 Package)\** | SE |  | 9 |  |  | III;6 |  |
| *402D4112 Research Methods and Scientific Writing* | R |  | 2 |  |  | IV;7 |  |
| *Elective Course\*\** | E |  | 2 |  |  | IV;7 |  |
| ***Total Required Minimum Lecture Courses*** | | 34 | 69 | 14 | 0 |  |  |
| *Total-ABET Basic Level Requirements* | |  |  |
| *Total Credit Hours for Lecture Courses* | 117 |  |  |  |  |  |  |
| *Percent of Total* | | 29,1% | 59,0% | 12,0% | 0,0% |  |  |
| *Total Must Satisfy Either Credit Hours of Percentage* | Minimum Semester Credit Hours | 32 Hours | 48 Hours |  |  |  |  |
| Minimum Percentage | 25,0% | 37,5% |  |  |  |  |
| **Non-Lecture Courses** | | | | | | | |
| *401D4112 Practical (On Job) Training* | R |  | 2 |  |  | IV;7 |  |
| *403D4112 Final Project Proposal* | R |  | 2 |  |  | IV;7 |  |
| *Laboratory 1* | R |  | 8 |  |  | IV;7 |  |
| *491D4124 Student Community Service Programs* | R |  | 4 |  |  | IV;8 |  |
| *492D4122 Final Project Results* | R |  | 2 |  |  | IV;8 |  |
| *Laboratory 2* | R |  | 8 |  |  | IV;8 |  |
| *493D4124 Final Project Report* | R |  | 2 |  |  | IV;8 |  |
| ***Total Credit Hours for Non-Lecture Courses*** | 30 |  |  |  |  |  |  |
| ***Overall Minimum Total Credit Hours For Completion of The Program*** | 147 |  |  |  |  |  |  |

Notes:

|  |  |  |
| --- | --- | --- |
| **Percentages of** | **Lecturer Course Only (117 credits)** | **Total Courses (145 credits)** |
| Non-Lecture Courses | Excluded (N/A) | 30 (20%) |
| Math & Basic Science | 34 (29%) | 34 (23%) |
| Engineering Topics | 69 (59%) | 69 (47%) |
| General Education | 14 (12%) | 14 (10%) |

The proportion of Mathematics and Basic Sciences is only 23% of the total 147 credit hours minimum requirement for graduation. However, 30 credit hours out of those 147 credit hours are non-lecturer courses, such as Final Undergraduate Projects (Final Project, Seminars, and Laboratories) and Student Community Services, which may have Mathematics and Basic Sciences contents and are not comparable (“apple to apple”) to the regular lecture courses. Based on argument above, the non-lecture courses may be excluded so that the proportion of Mathematics and Basic Science is now 29% of the total of 117 credit hours of regular lecturer courses.

The following information provides the components of the EESP curriculum.

**General Education**

The general education consists of 7 courses (total 14 credit hours). The general educations are listed in Table 5.2 General Education Component below. These fourteen credit hours satisfy all the requirements of the Hasanuddin University general education curriculum, which is design to accomplish the goals of Hasanuddin University as defined by its mission statements.

**Table 5-2 General Education Component**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **General Education** | **Credit** | **Course (%)** | **Lab (%)** | **Other (%)** |
| 011U0032 | Civic Education | 2 | 100 |  |  |
| 009U0032 | Indonesian Language | 2 | 100 |  |  |
| 001U0032 | Religion | 2 | 100 |  |  |
| 012U0032 | State Ideology: Pancasila | 2 | 100 |  |  |
| 010U0032 | English | 2 | 100 |  |  |
| 008U0032 | Concept of Science and Technology | 2 | 100 |  |  |
| 007U0032 | Social Science of Maritime Culture | 2 | 100 |  |  |

**Mathematics and Basic Science**

The mathematics and basic science consist of 34 (thirty-four) credit hours. It divides to 18 (eighteen) credit hours of mathematics as shown in the Table 5.3 and 16 (sixteen) credit hours of basic science as shown in The Table 5-4.

**Table 5-3 Mathematics Component**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **General Education** | **Credit** | **Course (%)** | **Lab (%)** | **Other (%)** |
| 016U0033 | Calculus 1 | 3 | 100 |  |  |
| 017U0033 | Calculus 2 | 3 | 100 |  |  |
| 201D4113 | Advanced Mathematics 1 | 3 | 100 |  |  |
| 210D4123 | Advanced Mathematics 1 | 3 | 100 |  |  |
| 211D4122 | Linear Systems | 2 | 100 |  |  |
| 302D4112 | Probability and Statistics | 2 | 100 |  |  |
| 342D4122 | Numerical Methods | 2 | 100 |  |  |

**Table 5-4 Basic Science Component**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **General Education** | **Credit** | **Course (%)** | **Lab (%)** | **Other (%)** |
| 020U0033 | Physics 1 | 3 | 67 | 33 |  |
| 022U0033 | Physics 2 | 3 | 67 | 33 |  |
| 206D4112 | Advanced Physics | 2 | 100 |  |  |
| 104D4112 | Advanced Chemistry | 2 | 100 |  |  |
| 205D4112 | Electric Engineering Material | 2 | 100 |  |  |
| 304D4112 | Electromagnetics | 2 | 100 |  |  |
| 344D4122 | Environmental Science | 2 | 100 |  |  |

**Engineering Topics**

The engineering topics component divides to 69 (minimum) credit hours of lecture course as shown in the Table 5-5 and 28 credit hours of no lecture course as shown in the Table 5-6.

**Table 5-5 Lecture Courses**

| **Code** | **General Education** | **Credit** | **Course (%)** | **Lab (%)** | **Other (%)** |
| --- | --- | --- | --- | --- | --- |
| 101D4113 | Electric Circuits 1 | 3 | 100 |  |  |
| 102D4112 | Logic Circuits | 2 | 100 |  |  |
| 103D4112 | Engineering Drawing | 2 | 100 |  |  |
| 105D4123 | Electric Circuits 2 | 3 | 100 |  |  |
| 106D4122 | Digital Systems | 2 | 100 |  |  |
| 107D4122 | Computer Programming | 2 | 50 | 50 |  |
| 108D4121 | Electric Circuits Laboratory | 1 |  | 100 |  |
| 109D4121 | Digital Systems Laboratory | 1 |  | 100 |  |
| 202D4112 | Basic Electric Power (Systems) | 2 | 100 |  |  |
| 203D4112 | Basic Telecommunication (Systems) | 2 | 100 |  |  |
| 204D4112 | Basic Electronics | 2 | 100 |  |  |
| 207D4111 | Basic Electric Power Laboratory | 1 |  | 100 |  |
| 208D4111 | Basic Telecommunication Laboratory | 1 |  | 100 |  |
| 209D4111 | Basic Electronics Laboratory | 1 |  | 100 |  |
| 212D4122 | Electric Machines | 2 | 100 |  |  |
| 213D4122 | Basic Multimedia | 2 | 100 |  |  |
| 214D4122 | Integrated Electronics | 2 | 100 |  |  |
| 215D4122 | Microprocessor Systems and Interfaces | 2 | 100 |  |  |
| 214D4122 | Basic Control Systems | 2 | 100 |  |  |
| 217D4122 | Electric Installation and Laboratory | 2 | 50 | 50 |  |
| 218D4121 | Integrated Electronics Laboratory | 1 |  | 100 |  |
| 219D4121 | Microprocessor Systems and Interfaces Lab | 1 |  | 100 |  |
| 301D4112 | Engineering Economics | 2 | 100 |  |  |
| 303D4112 | Electric Measurements | 2 | 100 |  |  |
| 343D4122 | Energy Conversions | 2 | 100 |  |  |
| 345D4122 | Management and Entrepreneurships | 2 | 100 |  |  |
| 402D4112 | Research Methods and Scientific Writing | 2 | 100 |  |  |
|  | Selected Elective Course (2 package) | 18 |  |  |  |

**Table 5-6 Non-Lecture Courses**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Code** | **General Education** | **Credit** | **Course (%)** | **Lab (%)** | **Other (%)** |
| 401D4112 | Practical (On Job) Training | 2 |  |  | 100 |
| 491D4124 | Student Community Service Programs | 4 |  |  | 100 |
| 446D4138 | Laboratory 1 | 8 |  | 100 |  |
| 447D4138 | Laboratory 2 | 8 |  | 100 |  |
| 403D4112 | Final Project Proposal | 2 |  | 100 |  |
| 492D4122 | Final Project Results | 2 |  | 100 |  |
| 493D4122 | Final project Report | 4 |  | 100 |  |

**The major design experience that prepares students for engineering practice.**

In the EESP curriculum, there are some courses credits allocated to give students experience in project design. In the first semester, students take the Engineering Drawing course (103D4112), in which the students learn how to use CAD (Computer-Aided Design) software to design for example electric and electronic circuits.

In Digital Systems course (106D412) and Digital Systems Lab (109D4121), the students learn to design logic circuits using a CAD Software Tools. In the last lab meeting, the students are divided into several groups and given a design project with any specifications. The students will then solve the problem given in the project, design digital circuit, implement it on a programmable logic device (in this case, we use Field Programmable Gate Array or FPGA device), and then test their functional and performance behaviors.

In Integrated Electronics Course (214D4122) and Integrated Electronics Lab (218D4121), the EESP students will learn how to design integrated circuits using educational CAD tools. The students learn how to design layout topographies of NMOS and PMOS transistors and CMOS logic circuits, simulate the circuit behaviors and analyze their performance.

In the Microprocessor Systems and Interfaces course (215D412) and Microprocessor Systems and Interfaces Lab (219D4121), the students learn design techniques to implement a simple microcontroller-based project. The students learn Assembly and C/C++ Programming language and use them to interface the microcontroller with some I/O units such as sensors and actuators through standard interfaces.

**The EESP cooperative education to satisfy curricular requirements**

The EESP allows students to gather experience in industries and in society by taking the Practical (On Job) Training course (401D4112) and the Student Community Service course (491D4124) proposed in the last semester.

In the Practical (On Job) Training course, the students will work part-time in industries. Two supervisors are assigned to assess the students work, one from industry and one from the EESP faculty member. The student make a report and presents his/her work in a small meeting with his/her supervisor. Both supervisors give then the grade of the student work according the student performance in industry.

In the Student Community Service course, a groups of students from the EESP and other disciplines will work and learn in a village. A few groups could be sent to rural areas. In the village, the students will analyze any problem in the society and then they will try to find the solution. Student supervisors, normally faculty staff from university, are assigned to assess the student work and will evaluate them and give a grade according to student performance.

**Final Examination and Scientific Writing**

In the 7th semester, the EESP students take the course of Research Methods and Scientific Writing (402D4112). In first 8 course meetings, the students learn research methodology, and then in the second 8 course meetings, students learn to write a scientific article. This scientific article is also presented in the Final examination in the last semester.

# CRITERION 6. FACULTY

## Faculty Qualifications

The EESP faculty core member consists of 29 members (23 Doctoral degree and 6 Master degree), which 6 of them are Full Professors and 17 associate professors. They finished their studies (Doctoral and Master program) in the area of electrical engineer- ing from various leading universities in Indonesia and overseas such as from University

of Wisconsin in the U.S.A, Kyushu University, Kumamoto University, Ehime Univer- sity, and Nara Institute of Science and Technology in Japan, Technische Universit´’at Darmstadt in Germany, the University of Queensland and University of Technology Sydney in Australia. Besides educational completion, all members obtained Lecturer

Certification from Indonesian government which confirmed their competence nationally as (professional) educators. Some of them have also Professional Engineers Certifica- tion from Indonesian Institution of Engineers, namely, 1 member is the holder for IPU certificate (highest) and 2 members have IPM certificate (medium). Their competence and expertise support highly the achievement level of learning in the EESP.

Faculty members expertise can be categorized into three main areas, namely, Telecom- munications and Information Engineering; Electric Power Engineering; and Computer, Control and Electronic Engineering.

In the area of Telecommunication and Information Engineering, the EESP has 9 main faculty core members. They have many years of experience in design and planning of telecommunication system related to wireless, satellite, fiber optic, antenna, traffic engineering, and switching. For Electric Power Engineering, the EESP has 15 faculty core members. They have expertise in Stability, Control and Power System Protection, Power Electronics, High Voltage and Isolation, Distribution of Power Systems and Electrical Installations, Power Systems and Electricity, Electricity Infrastructure. For Computer, Control and Electronic Engineering area, the EESP has 5 faculty core members. In addition, there is also one visiting lecturer from Germany, who help teaching in the Computer, Control and Electronic Engineering area. The name of Faculty Core Members is presented in Table 6-1. Most of the faculty conduct highly research activities and manage the research groups in their each field of expertise. They are also very active in writing some articles for some conferences and reputable international journals.

## Faculty Workload

The EESP full-time faculty members requires to fulfill 12-16 credits hours in each semester which covering the area of teaching, research, community service, and others. Teaching and research typically accounts for minimum 9 credits hours of workload, where teaching for minimum 6 credit hours. The teaching activities include thesis supervisor, examiner for proposal seminar and final year report, and academic advisor. The faculty members engage in minimum 3 hours of community service and other activities. Table 6-2 presents the Faculty Workload Summary and describes this information in terms of workload expectations or requirements.

Beside the 29 Faculty Core Members, the table presents also the workload for 3 Emeritus Pro- fessors, 1 Guest Lecturer, 1 Visiting Lecturer from Germany and 7 Faculty Member from Department of Informatic, who teach also some EESP’s courses.

Most of the faculty members conduct highly research activities and manage the research groups in their each field of expertise. They are also very active in writing some articles for some conferences and reputable international journals.

Interactions with students: Several ways are conducted to interact closely between faculty and students, such as face-to-face meeting in classroom or meeting in the faculty room. Interaction can also be done through online media including e-mail, Learning Management System (LMS), social media, and special social media application. The interactions are usually done in relation to the assignment of the course, faculty as academic adviser, as a supervisor: undergraduate research and field study, student activities i.e. robotic contest.

University service activities: The service activities carried out by the faculty are extensive, both on campus and off campus. Some faculty members become members of the university division. Also some faculty members participate in various committees for university or faculty activities, participate in coaching student activities such as robot contests, student creativity programs, and others. In addition, participation is also conducted outside the campus to serve the community such as Procurement and counseling on how to obtain clean water for people in areas that are difficult to get clean water; Engagement in electricity-saving education programs and the use of solar panels for locations that have no electricity services covered by the government.

## Faculty Size

The faculty members are sufficient to cover all of the courses both required engineering courses and elective courses, with at least two faculty members competent of teaching the courses. All of the courses are presented at once a year, and some of the elective courses are offered for every semester.

Interactions with students: Several ways are conducted to interact between faculty and students. The faculty interacts closely with the students by face-to-face meeting in classroom or meeting in the faculty room. Interaction can also be done through online media such as e-mail, Learning Management System (LMS), social media, and special social media application groups. The interactions are usually done in relation to the assignment of the course, faculty as academic advisor, as a supervisor: undergraduate research and field study, student activities i.e. robotic contest.

University service activities: The service activities carried out by the faculty are extensive, both on campus and off campus. Some faculty members become members of the university division. Also some faculty members participate in various committees for university or faculty activities, participate in coaching student activities such as robot contests, student creativity programs, and others. In addition, participation is also conducted outside the campus to serve the community. Community service in the form of: Procurement and counseling on how to obtain clean water for people in areas that are difficult to get clean water. Engaged in electricity-saving education programs and the use of solar panels for locations that have not installed electricity services by the government.

Professional development: Professional development for faculty members is regularly carried out. A faculty is required to take apart in the course design and pedagogical techniques training such as Instructional Technique for Basic Skills Improvement Training and Applied Approach Training. Some of the trainings are also attended by faculty members such as training on: the research proposal preparation, the strategy to penetrate international scientific journal publications, and the research output utilization with potential for patents. In addition to professional developments, the faculty members also build effective network with others lecturer in both domestic and abroad through post graduated program in foreign universities, national and international conferences, the program of scheme for academic mobility and exchange (SAME) in foreign universities.

Interactions with industrial and professional practitioners including employers of students: Some of the faculty members are actively involved in solving industrial problems, and conducting collaborative research such as with electric utility and cement companies. The EESP is regularly invited representatives from industry as guest lecturers in undergraduate classes to give public lectures to broaden the students understanding of current industrial context.

## Professional Development

The summary of professional development activities for each faculty member is presented Table 6.3.

## Authority and Responsibility of Faculty

Faculty members at the EESP have responsibility related to academic program in electrical engineering which is approved by faculty. Besides semester evaluation, every five years, faculty members evaluate / review the implementation of academic program as a whole including such us program goals, curriculum, student ratings, and equipment resources. The review is intended to know the implementation level of the academic program so it can be used as a reference in designing the next academic program. If there are big changes such as deleting or adding new course, then it is proposed to department and forwarded to faculty for final approval. Faculty members have authority for course modifications.

## C Table 6-1. Faculty Qualifications

**Electrical Engineering Study Program (EESP)**

| ***Faculty Name*** | ***Highest Degree Earned- Field and Year*** | ***Rank 1*** | ***Type of Academic Appointment2***  ***T, TT, NTT*** | ***FT or PT3*** | ***Years of Experience*** | | | ***Professional Registration/ Certification5*** | ***Level of Activity4***  ***H, M, or L*** | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Govt./Ind. Practice*** | ***Teaching*** | ***This Institution*** | ***Professional Organizations*** | ***Professional Development*** | ***Consulting/summer work in industry*** |
| Ansar Suyuti | Dr., Eng. Science, 2013 | P |  | FT |  |  | 26 | PE |  |  |  |
| Syafruddin Syarif | Dr., Eng. Science, 2013 | P |  | FT |  |  | 30 |  |  |  |  |
| Andani Achmad | Dr., Eng. Science, 2010 | P |  | FT |  |  | 31 |  |  |  |  |
| Salama Manjang | Dr., Power Eng., 2001 | P |  | FT |  |  | 28 | PE |  |  |  |
| Zaenab Muslimin | MS, Elec. Eng., 2004 | ASC |  | FT |  |  | 26 |  |  |  |  |
| Sri Mawar Said | Dr., Eng. Science, 2014 | ASC |  | FT |  |  | 32 |  |  |  |  |
| Elyas Palantei | Dr., Elec. Eng. | ASC |  | FT |  |  | 24 |  |  |  |  |
| Gassing | MS, Elec. Eng. | ASC |  | FT |  |  | 31 |  |  |  |  |
| Zulfajri Basri Hasanuddin | Dr., Elec. Eng., 2003 | ASC |  | FT |  |  | 25 |  |  |  |  |
| Zahir Zainuddin | Dr., Elec. Eng. | ASC |  | FT |  |  | 29 |  |  |  |  |
| Indar Chaerah Gunadin | Dr., Elec. Eng., 2013 | ASC |  | FT |  |  | 20 |  |  |  |  |
| Yusran | Dr., Elec. Eng., 2013 | ASC |  | FT |  |  | 18 |  |  |  |  |
| Rhiza Samsoe’oed Sadjad | Dr., Control Eng., 1994 | ASC |  | FT | 2.5 | 28 | 36 |  |  |  |  |
| Dewiani | Dr., Elec. Eng., 2013 | ASC |  | FT | - | 18 | 24 |  |  |  |  |
| Indrabayu | Dr., Eng. Science, 2013 | ASC |  | FT |  |  | 16 |  |  |  |  |
| Intan Sari Areni | Dr., Elec. Eng., 2013 | ASC |  | FT |  |  | 18 |  |  |  |  |
| Syafaruddin | Dr., Power Eng., 2009 | P |  | FT |  |  | 19 |  |  |  |  |
| Amil Ahmad Ilham | Dr., Comp. Eng., 2011 | ASC |  | FT |  |  | 20 |  |  |  |  |
| Wardi | Dr., Elec. Eng., 2012 | AST |  | FT |  |  | 19 |  |  |  |  |
| Muhammad Niswar | Dr., Comp. Eng., 2010 | AST |  | FT |  |  | 19 |  |  |  |  |
| Faizal Arya Samman | Dr., Elec. Eng, 2010 | P |  | FT | 2.8 | 11 | 16 |  |  |  |  |
| Inggrid Nurtanio | Dr., Eng. Science, 2013 | AST |  | FT |  |  | 30 |  |  |  |  |
| A. Ejah Umraeni Salam | Dr., Eng. Science, 2015 | AST |  | FT | - | 18 | 21 |  |  |  |  |
| Ardiaty Arief | Dr., Elec. Eng., 2012 | AST |  | FT |  |  | 17 |  |  |  |  |
| Yusri Syam Akil | Dr., Elec. Eng., 2013 | AST |  | FT |  |  | 13 |  |  |  |  |
| Ikhlas Kitta | Dr., Eng. Science, 2016 | AST |  | FT |  |  | 10 | PE |  |  |  |
| Christoforus Yohannes | MS, Elec. Eng., 2002 | AST |  | FT |  |  | 21 |  |  |  |  |
| Muhammad Bachtiar Nappu | Dr., Elec. Eng., 2013 | ASC |  | FT |  |  | 15 |  |  |  |  |
| Adnan | Dr., Comp. Eng., 2013 | AST |  | FT |  |  | 13 |  |  |  |  |
| Hasniaty A. | MS, Elec. Eng., 2002 | AST |  | FT |  |  | 18 |  |  |  |  |
| Ida Rachmaniar Sahali | MS, Elec. Eng., 2012 | AST |  | FT | 2 | 5 | 5 |  |  |  |  |
| Muhammad Anshar | Dr., Elec. Eng., 2017 | AST |  | FT |  |  | 13 |  |  |  |  |
| Merna Baharuddin | Dr., Elec. Eng., 2010 | AST |  | FT |  |  | 13 |  |  |  |  |
| Andini Dani Achmad | MS, Elec. Eng., | AST |  | FT |  |  |  |  |  |  |  |
| Nadjamuddin Harun | Dr., Elec. Eng. | Em |  | PT |  |  | 50 |  |  |  |  |
| Muhammad Tola | Dr., Elec. Eng. | Em |  | PT |  |  | 41 |  |  |  |  |
| Muhammad Arief | Dr., Elec. Eng. | Em |  | PT |  |  | 48 |  |  |  |  |
| Sonny Taniadji | Ir., Elec. Eng. | A |  | PT |  |  |  |  |  |  |  |
| Andreas Vogel | Dipl.-Ing., Elec. Eng. | A |  | PT |  | 9 | 12 |  |  |  |  |
| Tajuddin Waris | MS, EE, (Dr. in progress) | AST |  | FT |  |  | 26 |  |  |  |  |
| Fitriyanti Mayasari | MS, EE, (Dr. in progress) | AST |  | FT |  |  | 12 |  |  |  |  |
| Asran Budi | MS, Elec. Eng., 2014 | I |  | FT |  |  | 1 |  |  |  |  |

## Table 6-2. Faculty Workload Summary

**Electrical Engineering Study Program**

| ***No*** | ***Faculty Member (name)*** | ***PT or FT1*** | ***Classes Taught (Course No./Credit Hrs.) Term\* and Year\*\**** | ***Program Activity Distribution (%)3*** | | | | | | ***% of Time Devoted to the to the Program5*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Teaching*** | | ***Research or Scholarship*** | | ***Other4*** | |
| ***1st*** | ***2nd*** | ***1st*** | ***2nd*** | ***1st*** | ***2nd*** |
| 1 | Ansar Suyuti | FT | 1. Engineering Economics (301D4112/27) 1st  2. Electrical Measurement (303D4112/27) 1st  3. Electric Motor Application (406D4132/27) 1st  4. Electric Installations Laboratory (217D4122/27) 2nd  5. Electric Machines (212D4122/27) 2nd  6. Management and Entrepreuneurship (345D4122/27) 2nd  7. Algorithm and Data Structure (366D4122/27) 2nd | 48 | 53 | 22 | 13 | 30 | 33 | 100% |
| 2 | Syafruddin Syarif | FT | 1. Digital Communication (324D4112/27) 1st  2. Terresterial Network Design (320D4112/27) 1st  3. Information Theory and Coding (355D4122/27) 2nd  4. Telecommunication Systems Performance (364D4122/27) 2nd  5. Wireless Technology (354D4122/27) 2nd | 43 | 58 | 26 | 12 | 31 | 30 | 100% |
| 3 | Andani Achmad | FT | 1. Logic Circuits (102D4112/27) 1st  2. Basic Electronics (204D4112/27) 1st  3. Basic Electronics Laboratory (209D4111/13) 1st  4. Probability and Statistics (302D4112/27) 1st  5. Process Control Technology (330D4112/27) 1st  6. Optical Fibre Communication (323D4112/27) 1st  7. Digital Systems (106D4122/27) 2nd  8. Spread Spectrum (354D4122/27) 2nd  9. Control Systems Design (374D4122/27) 2nd | 44 | 42 | 26 | 29 | 30 | 29 | 100% |
| 4 | Salama Manjang | FT | 1. Electrical Engineering Materials (205D4112/27) 1st  2. Electromagnetics (304D4112/27) 1st  3. Electric Power Distribution Systems + Lab. (348D4122/27) 2nd  4. High Voltage Engineering + Laboratory (352D4122/27) 2nd  5. Electric Power Distribution Systems + Lab. (348D4122/27) 2nd | 45 | 48 | 24 | 19 | 32 | 33 | 100% |
| 5 | Zaenab Muslimin | FT | 1. Electrical Circuits 1 (101D4113/40) 1st  2. Probability and Statistics (302D4112/27) 1st  3. Electric Circuits 2 (105D4123/40) 2nd  4. Electric Circuits Laboratory (108D4121/13) 2nd  5. Linear Systems (211D4122/27) 2nd | 50 | 61 | 20 | 8 | 30 | 32 | 100% |
| 6 | Sri Mawar Said | FT | 1. Electrical Circuits 1 (101D4113/40) 1st  2. Basic Electric Power (Systems) (202D4112/27) 1st  3. Basic Electric Power laboratory (207D4111/13) 1st  4. Electric Power Protection System 1 (308D4112/27) 1st  5. Electric Circuits 2 (105D4123/40) 2nd  6. Electric Circuits Laboratory (108D4121/13) 2nd  7. Electric Power Protection System 2 + Lab. (349D4122/27) 2nd  8. Electric Machines Analysis 2 + Laboratory (350D4122/27) 2nd | 46 | 66 | 23 | 5 | 31 | 29 | 100% |
| 7 | Elyas Palantei | FT | 1. Electromagnetics (304D4112/27) 1st  2. Basic Multimedia (213D4122/27) 2nd  3. Telecomm. Management and Regulations (353D4122/27) 2nd  4. Multimedia Signal Processing + Laboratory (360D4123/40) 2nd | 44 | 43 | 22 | 23 | 34 | 34 | 100% |
| 8 | Gassing | FT | 1. Advance Chemistry (104D4112/27) 1st  2. Basic Electric Power (Systems) (202D4112//27) 1st  3. Advance Physics (206D4112/27) 1st  4. Basic Electric Power laboratory (207D4111/13) 1st  5. Electric Power Generation Systems (309D4112/27) 1st  6. Electric Machines Analysis 2 + Laboratory (350D4122/40) 1st  7. Electric Installations Laboratory (217D4122/27) 2nd  8. Electric Machines (212D4122/27) 2nd  9. Numerical Methods (342D4122/27) 2nd | 46 | 48 | 20 | 23 | 35 | 29 | 100% |
| 9 | Zulfajri B. Hasanuddin | FT | 1. Probability and Statistics (302D4112/27) 1st  2. Satellite Communication Systems (314D4112/27) 1st  3. Terresterial Network Design (320D4112/27) 1st  4. Telecomm. Management and Regulations (353D4122/27) 2nd  5. Telecommunication Systems Performance (364D4122/27) 2nd  6. Radar and Navigation (365D4122/27) 2nd  7. Wireless Technology (354D4122/27) 2nd | 51 | 60 | 24 | 9 | 24 | 31 | 100% |
| 10 | Zahir Zainuddin | FT | 1. Logic Circuits (102D4112/27) 1st  2. Engineering Drawing (103D4112/27) 1st  3. Microprocessor Systems and Interfaces (215D4122/27) 2nd  4. Microprocessor Systems and Interfaces Lab. (219D4121/13) 2nd  5. Artificial Intelligence Systems (435D4132/27) 2nd | 45 | 50 | 26 | 24 | 30 | 26 | 100% |
| 11 | Indar Chaerah Gunadin | FT | 1. Advance Physics (206D4112/27) 1st  2. Basic Electric Power (Systems) (202D4112//27) 1st  3. Basic Electric Power laboratory (207D4111/13) 1st  4. Electrical Measurement (303D4112/27) 1st  5. Control and Stability of Electric Power System (310D4112/27) 1st  6. Intelligent Electric Power Systems (411D4132/27) 1st  7. Environmental Science (344D4122/27) 2nd  8. Basic Control Systems (216D4122/27) 2nd | 41 | 42 | 29 | 25 | 29 | 33 | 100% |
| 12 | Yusran | FT | 1. Advance Chemistry (104D4112/27) 1st  2. Advance Physics (206D4112/27) 1st  3. Electrical Measurement (303D4112/27) 1st  4. Electric Power Generation Systems (309D4112/27) 1st  5. Electromagnetics (304D4112/27) 1st  6. Intelligent Electric Power Systems (411D4132/27) 1st  7. Environmental Science (344D4122/27) 2nd  8. Electric Machines (212D4122/27) 2nd  9. Advance Mathematics 2 (210D4123/27) 2nd | 53 | 50 | 16 | 18 | 31 | 32 | 100% |
| 13 | Rhiza S. Sadjad | FT | 1. Process Control Technology (330D4112/27) 1st  2. Control Systems + Laboratory (329D4113/27) 1st  3, Basic Control Systems (216D4122/27) 2nd  4. Control Systems Design (374D4122/27) 2nd  5. Optimal Control Systems (372D4122/27) 2nd  6. Digital Control Systems + Laboratory (371D4123/40) 2nd | 57 | 60 | 10 | 9 | 32 | 31 | 100% |
| 14 | Dewiani | FT | 1. Basic Telecommunication (Systems) (203D4112/27) 1st  2. Basic Telecommunication Laboratory (208D4111/13) 1st  3. Advance Mathematics 1 (201D4113/40) 1st  4. Probability and Statistics (302D4112/27) 1st  5. Optical Fibre Communication (323D4112/27) 1st  6. Telecommunication Network Optimization (433D4132/27) 2nd  7. Advance Mathematics 2 (210D4123/27) 2nd  8. Linear Systems (211D4122/27) 2nd | 55 | 46 | 13 | 20 | 32 | 34 | 100% |
| 15 | Indrabayu | FT | 1. Engineering Economics (301D4112/27) 1st  2. Artificial Intelligence Systems (435D4132/27) 1st  3. Basic Multimedia (213D4122/27) 2nd | 46 | 48 | 20 | 21 | 35 | 31 | 100% |
| 16 | Intan Sari Areni | FT | 1. Advance Mathematics 1 (201D4113/40) 1st  2. Basic Telecommunication (Systems) (203D4112/27) 1st  3. Advance Mathematics 1 (201D4113/40) 1st  4. Basic Telecommunication Laboratory (208D4111/13) 1st  5. Digital Communication (324D4112/27) 1st  6. Linear Systems (211D4122/27) 2nd  7. Multimedia Signal Processing + Laboratory (360D4123/40) 2nd  8. Analog and Digital Filters (359D4122/27) 2nd | 47 | 46 | 22 | 23 | 31 | 32 | 100% |
| 17 | Syafaruddin | FT | 1. Electric Power System Analysis (306D4112/27) 1st  2. Energy Conversion (343D4122/27) 2nd  3. Numerical Methods (342D4122/27) 2nd | 45 | 47 | 24 | 23 | 31 | 31 | 100% |
| 18 | Amil Ahmad Ilham | FT | 1. Web Programming (327D4112/27) 1st  2. Cloud Computing (328D4112/27) 1st  3. Digital Systems (106D4122/27) 2nd  4. Algorithm and Data Structure (366D4122/27) 2nd | 43 | 46 | 21 | 22 | 35 | 32 | 100% |
| 19 | Wardi | FT | 1. Basic Telecommunication (Systems) (203D4112/27) 1st  2. Basic Electronics (204D4112/27) 1st  3. Basic Telecommunication Laboratory (208D4111/13) 1st  4. Basic Electronics Laboratory (209D4111/13) 1st  5. Special Topics in Telecommunication Network (425D4132/27) 1st  6. Data Communication (321D4112/27) 1st  7. Basic Multimedia (213D4122/27) 2nd  8. Multmedia (Network) Systems (362D4122/27) 2nd | 50 | 52 | 19 | 21 | 31 | 27 | 100% |
| 20 | Muhammad Niswar | FT | 1. Logic Circuits (102D4112/27) 1st  2. Computer Network + Laboratory (325D4112/27) 1st Sem 3. Web Programming (327D4112/27) 1st  4. Digital System Design + Laboratory (335D4113/40) 1st  5. Digital Systems (106D4122/27) 2nd  6. Computer Programming (107D4122/27) 2nd | 47 | 42 | 21 | 26 | 32 | 32 | 100% |
| 21 | Faizal Arya Samman | FT | 1. Basic Electronics (204D4112/27) 1st  2. Basic Electronics Laboratory (209D4111/13) 1st  3. Integrated Circuits Technology (339D4112/27) 1st  4. Digital System Design + Laboratory (335D4113/40) 1st  5. Digital Systems (106D4122/27) 2nd  6. Integrated Electronics (214D4122/27) 2nd  7. Basic Control Systems (216D4122/27) 2nd  8. Digital Systems Laboratory (109D4121/13) 2nd  9. Integrated Electronics Laboratory (218D4121/13) 2nd | 41 | 47 | 29 | 21 | 30 | 33 | 100% |
| 22 | Ingrid Nurtanio | FT | 1. Advance Mathematics 1 (201D4113/40) 1st Sem 2. Advance Mathematics 2 (210D4123/27) 2nd  3. Intelligent Control Systems (373D4122/27) 2nd | 45 | 49 | 18 | 19 | 37 | 32 | 100% |
| 23 | A. Ejah Umraeni Salam | FT | 1. Logic Circuits (102D4112/27) 1st  2. Basic Electronics (204D4112/27) 1st  3. Basic Electronics Laboratory (209D4111/13) 1st  4. Control Systems + Laboratory (329D4113/27) 1st  5. Artificial Intelligence Systems (435D4132/27) 1st  6. Integrated Electronics (214D4122/27) 2nd  7. Basic Control Systems (216D4122/27) 2nd  8. Optimal Control Systems (372D4122/27) 2nd  9. Linear Systems (211D4122/27) 2nd  10. Digital Control Systems + Laboratory (371D4123/40) 2nd | 44 | 51 | 23 | 17 | 32 | 32 | 100% |
| 24 | Ardiaty Arief | FT | 1. Control and Stability of Electric Power System (310D4112/27) 1st  2. Alternating Current Transmission Systems (305D4112/27) 1st  3. Electric Power System Analysis (306D4112/27) 1st  4. Energy Conversion (343D4122/27) 2nd  5. Power Systems Operations (351D4122/27) 2nd | 44 | 47 | 26 | 23 | 30 | 30 | 100% |
| 25 | Yusri Syam Akil | FT | 1. Basic Electric Power (Systems) (202D4112/27) 1st  2. Basic Electric Power laboratory (207D4111/13) 1st  3. Electrical Measurement (303D4112/27) 1st  4. Electric Motor Application (406D4132/27) 1st  5. Energy Conversion (343D4122/27) 2nd  5. Electric Power System Analysis (306D4112/27) 2nd | 45 | 45 | 23 | 23 | 32 | 32 | 100% |
| 26 | Ikhlas Kitta | FT | 1. Basic Electric Power (Systems) (202D4112/27) 1st  2. Electrical Engineering Materials (205D4112/27) 1st  3. Basic Electric Power laboratory (207D4111/13) 1st  4. Alternating Current Transmission Systems (305D4112/27) 1st  5. Electric Installations Laboratory (217D4122/27) 2nd  6. Electric Power Distribution Systems + Lab. (348D4122/27) 2nd | 40 | 62 | 33 | 8 | 27 | 31 | 100% |
| 27 | Christoforus Yohannes | FT | 1. Advance Chemistry (104D4112/27) 1st  2. Industrial Robotics (331D4112/27) 1st  3. Industrial Automation + Laboratory (PLC) (337D4112/27) 1st  4. Integrated Electronics (214D4122/27) 2nd  5. Microprocessor Systems and Interfaces (215D4122/27) 2nd  6. Microprocessor Systems and Interfaces Lab. (219D4121/13) 2nd | 47 | 60 | 21 | 7 | 32 | 32 | 100% |
| 28 | Muhammad Bachtiar Nappu | FT | 1. Advance Physics (206D4112/27) 1st  2. Electricity Market (413D4132/27) 1st  3. Numerical Methods (342D4122/27) 2nd  4. Power Systems Operations (351D4122/27) 2nd | 45 | 48 | 24 | 22 | 31 | 30 | 100% |
| 29 | Adnan | FT | 1. Logic Circuits (102D4112/27) 1st  2. Computer Programming (107D4122/27) 2nd | 48 | 49 | 21 | 19 | 30 | 32 | 100% |
| 30 | Hasniaty A. | FT | 1. Electrical Circuits 1 (101D4113/40) 1st  2. Advance Chemistry (104D4112/27) 1st  3. Advance Physics (206D4112/27) 1st  4. Electric Circuits 2 (105D4123/40) 2nd  5. Advance Mathematics 2 (210D4123/27) 2nd  6. Electric Circuits Laboratory (108D4121/13) 2nd  7. Electric Power System Analysis (306D4112/27) 2nd  8. Electric Machines Analysis 2 + Laboratory (350D4122/27) 2nd | 61 | 58 | 0 | 4 | 39 | 38 | 100% |
| 31 | Ida Rachmaniar Sahali | FT | 1. Computer Network + Laboratory (325D4112/27) 1st  2. Data Communication (321D4112/27) 1st  3. Industrial Automation + Laboratory (PLC) (337D4112/27) 1st  4. Digital Systems (106D4122/27) 2nd  5. Computer Programming (107D4122/27) 2nd | 50 | 74 | 17 | 5 | 33 | 21 | 100% |
| 32 | Muhammad Anshar | FT | 1. Engineering Drawing (103D4112/27) 1st  2. Basic Electronics (204D4112/27) 1st  3. Basic Electronics Laboratory (209D4111/13) 1st  4. Industrial Robotics (331D4112/27) 1st  5. Integrated Electronics (214D4122/27) 2nd  6. Microprocessor Systems and Interfaces (215D4122/27) 2nd  7. Intelligent Control Systems (373D4122/27) 2nd  8. Microprocessor Systems and Interfaces Lab. (219D4121/13) 2nd  9. Embedded Systems Design + Laboratory (380D4123/40) 2nd | 45 | 46 | 25 | 23 | 31 | 31 | 100% |
| 33 | Merna Baharuddin | FT | 1. Basic Telecommunication (Systems) (203D4112/27) 1st  2. Basic Telecommunication Laboratory (208D4111/13) 1st  3. Special Topics in Telecommunication Network (425D4132/27) 1st  4. Telecommunication Transmission Systems (312D4112/27) 1st  5. Basic Multimedia (213D4122/27) 2nd  6. Spread Spectrum (354D4122/27) 2nd  7. Analog and Digital Filters (359D4122/27) 2nd | 55 | 64 | 17 | 11 | 28 | 25 | 100% |
| 34 | Andini Dani Achmad | FT | 1. Logic Circuits (102D4112/27) 1st  2. Basic Telecommunication (Systems) (203D4112/27) 1st  3. Basic Telecommunication Laboratory (208D4111/13) 1st  4. Advance Mathematics 1 (201D4113/40) 1st  5. Telecommunication Transmission Systems (312D4112/27) 1st  6. Digital Systems (106D4122/27) 2nd  7. Computer Programming (107D4122/27) 2nd  8. Telecommunication Network Optimization (433D4132/27) 2nd  9. Advance Mathematics 2 (210D4123/27) 2nd  10. Multmedia (Network) Systems (362D4122/27) 2nd | 53 | 59 | 16 | 10 | 31 | 31 | 100% |
| 35 | Nadjamuddin Harun | PT | 1. Electric Power Generation Systems (309D4112/27) 1st  2. Environmental Science (344D4122/27) 2nd  3. Basic Control Systems (216D4122/27) 2nd | 100 | 100 | - | - | - | - | 100% |
| 36 | Muhammad Tola | PT | 1. Advance Physics (206D4112/27) 1st  2. Opto-electronics (404D4132/27) 1st | 100 | 100 | - | - | - | - | 100% |
| 37 | Muhammad Arief | PT | 1. High Voltage Engineering + Laboratory (352D4122/27) 2nd | 100 | 100 | - | - | - | - | 100% |
| 38 | Sonny Taniadji | PT | 1. Electric Power Protection System 1 (308D4112/27) 1st  2. Electric Power Protection System 2 + Laboratory (349D4122/27) 2nd | 100 | 100 | - | - | - | - | 100% |
| 39 | Andreas Vogel | PT | 1. Integrated Electronics (214D4122/27) 2nd  2. Digital Systems Laboratory (109D4121/13) 2nd  3. Integrated Electronics Laboratory (218D4121/13) 2nd  4. Embedded Systems Design + Laboratory (380D4123/40) 2nd | 100 | 100 | - | - | - | - | 100% |
| 40 | Tajuddin Waris | FT | N/A | 0 | 0.0 | 100 | 100 | 0 | 0 | N/A |
| 41 | Fitriyanti Mayasari | FT | N/A | 0 | 0.0 | 100 | 100 | 0 | 0 | N/A |
| 42 | Asran Budi | FT | N/A | 0 | 0.0 | 100 | 100 | 0 | 0 | N/A |

1. FT = Full Time Faculty or PT = Part Time Faculty, at the institution

**Table 6-3 Summary of Professional Development Activities for Faculty Members.**

| ***No*** | ***Faculty Name*** | ***Conference*** | | ***Workshop*** | | ***Instructional Training*** |
| --- | --- | --- | --- | --- | --- | --- |
| ***Presenter*** | ***Attendance*** | ***Presenter*** | ***Attendance*** |
| 1 | Ansar Suyuti | 9 | 9 | 0 | 3 | 4 |
| 2 | Syafruddin Syarif | 9 | 30 | 6 | 13 | 5 |
| 3 | Andani Achmad | 6 | 7 | 0 | 5 | 3 |
| 4 | Salama Manjang | 10 | 3 | 1 | 3 | 5 |
| 5 | Zaenab Muslimin | 1 | 0 | 0 | 1 | 3 |
| 6 | Sri Mawar Said | 1 | 1 | 0 | 1 | 2 |
| 7 | Elyas Palantei |  |  |  |  |  |
| 8 | Gassing | 1 | 2 | 2 | 1 | 4 |
| 9 | Zulfajri Basri Hasanuddin | 6 | 6 | 4 | 7 | 2 |
| 10 | Zahir Zainuddin | 5 | 5 | 2 | 2 | 2 |
| 11 | Indar Chaerah Gunadin | 5 | 3 | 3 | 2 | 4 |
| 12 | Yusran | 4 | 2 | 1 | 2 | 2 |
| 13 | Rhiza Samsoe’oed Sadjad | 0 | 0 | 0 | 0 | 1 |
| 14 | Dewiani | 4 | 0 | 0 | 2 | 3 |
| 15 | Indrabayu | 12 | 8 | 4 | 4 | 8 |
| 16 | Intan Sari Areni | 7 | 4 | 1 | 3 | 3 |
| 17 | Syafaruddin | 26 | 3 | 0 | 1 | 2 |
| 18 | Amil Ahmad Ilham | 4 | 3 | 0 | 2 | 2 |
| 19 | Wardi | 5 | 3 | 2 | 2 | 2 |
| 20 | Muhammad Niswar | 6 | 0 | 1 | 0 | 2 |
| 21 | Faizal Arya Samman | 13 | 2 | 2 | 0 | 2 |
| 22 | Inggrid Nurtanio | 6 | 8 | 0 | 2 | 3 |
| 23 | Ejah Umraeni Salam | 5 | 10 | 0 | 3 | 2 |
| 24 | Ardiaty Arief | 14 | 0 | 3 | 0 | 2 |
| 25 | Yusri Syam Akil | 10 | 3 | 0 | 2 | 2 |
| 26 | Ikhlas Kitta | 2 | 4 | 1 | 1 | 1 |
| 27 | Christoforus Yohannes | 3 | 5 | 2 | 1 | 4 |
| 28 | Muhammad Bachtiar Nappu | 28 | 0 | 3 | 0 | 3 |
| 29 | Adnan | 1 | 1 | 0 | 2 | 3 |
| 30 | Hasniaty A. | 5 | 4 | 0 | 6 | 2 |
| 31 | Ida Rachmaniar Sahali | 1 | 2 | 0 | 2 | 4 |
| 32 | Muhammad Anshar | 9 | 0 | 2 | 0 | 0 |
| 33 | Merna Baharuddin | 10 | 5 | 0 | 2 | 2 |
| 34 | Andini Dani Achmad | 3 | 5 | 0 | 2 | 0 |
| 35 | Nadjamuddin Harun |  |  |  |  |  |
| 36 | Muhammad Tola |  |  |  |  |  |
| 37 | Muhammad Arief |  |  |  |  |  |
| 38 | Sonny Taniadji |  |  |  |  |  |
| 39 | Andreas Vogel |  |  |  |  |  |
| 40 | Tajuddin Waris |  |  |  |  |  |
| 41 | Fitriyanti Mayasari |  |  |  |  |  |
| 42 | Asran Budi |  |  |  |  |  |

**Table 6-4 Faculty Core Members.**

|  |  |  |
| --- | --- | --- |
| ***No.*** | ***Faculty Name*** | ***Field of Study*** |
| 1 | Salama Manjang (Head of Department) | Electric Power Engineering |
| 4 | Ansar Suyuti | Electric Power Engineering |
| 5 | Syafaruddin | Electric Power Engineering |
| 6 | Sri Mawar Said | Electric Power Engineering |
| 7 | Zaenab Muslimin | Electric Power Engineering |
| 8 | Tajuddin Waris | Electric Power Engineering |
| 9 | Gassing | Electric Power Engineering |
| 10 | Indar Chaerah Gunadin | Electric Power Engineering |
| 11 | Yusran | Electric Power Engineering |
| 12 | Muhammad Bachtiar Nappu | Electric Power Engineering |
| 13 | Ikhlas Kitta | Electric Power Engineering |
| 14 | Yusri Syam Akil | Electric Power Engineering |
| 15 | Hasniaty A. | Electric Power Engineering |
| 16 | Fitriyanti Mayasari | Electric Power Engineering |
| 17 | Ardiaty Arief | Electric Power Engineering |
| 18 | Syafruddin Syarif | Telecommunication Engineering |
| 19 | Andani Achmad | Telecommunication Engineering |
| 20 | Zulfajri Basri Hasanuddin | Telecommunication Engineering |
| 21 | Elyas Palantei | Telecommunication Engineering |
| 22 | Dewiani | Telecommunication Engineering |
| 23 | Wardi | Telecommunication Engineering |
| 24 | Intan Sari Areni | Telecommunication Engineering |
| 25 | Merna Baharuddin | Telecommunication Engineering |
| 26 | Andini Dani Achmad | Telecommunication Engineering |
| 27 | Asran Budi | Telecommunication Engineering |
| 28 | Rhiza Samsoe’oed Sadjad | Electronics, Control and Computer Engineering |
| 29 | A. Ejah Umraeni Salam | Electronics, Control and Computer Engineering |
| 30 | Faizal Arya Samman | Electronics, Control and Computer Engineering |
| 31 | Muhammad Anshar | Electronics, Control and Computer Engineering |
| 32 | Ida Rachmaniar Sahali | Electronics, Control and Computer Engineering |

# CRITERION 7. FACILITIES[[2]](#footnote-2)

**Not yet submitted** for Readiness Review.

# 

# CRITERION 8. INSTITUTIONAL SUPPORT

**Not yet submitted** for Readiness Review.

# PrOGRAM CRITERIA

The EESP evaluates the aforementioned outcomes regularly using two types of student performance assessments, i.e. direct and indirect assessments. In the direct assessments, each student’s is evaluated for certain performance criteria. These assessments are part of the grading of student works in the EESP courses. The direct assessment method includes also the student portfolios enrichment.

The indirect measurements are done through surveys. Upon completing their course, students are asked to take the surveys through the EESP and UNHAS webpages. Graduating students are also asked to take the senior exit survey which is a self-assessments for the student’s outcomes. The indirect assessments are also made through Alumni and Employers Surveys.

Both the direct and indirect assessment methods have been described in Criterion 4 (Continuous Improvement), and is illustrated in Figure 9-1. The EESP collects data from the assessment methods and use them to evaluate the expected and the measured (real) student outcomes. The improvements are then made according to the evaluation results. The improvement actions can be made using the following:

1. Improve the quality of course materials
2. Invite international visiting lecturers
3. Organize staff’s professional development and/or
4. Reform the curriculum structure



Figure 9-1 Continuous Improvement diagram.

# Appendix A – Course Syllabi

**FOR THIS REPORT, ONLY COURSE SYLLABI FOR THE DISCIPLINE-SPECIFIC COURSES OF THE PROGRAM ARE INCLUDED FOR READINESS REVIEW**

The information provided in each syllabus in this report is as follows.

1. Course number and name.
2. Credits and contact hours.
3. Instructor’s or course coordinator’s name.
4. Text book, (title, author, and year), and other supplemental materials
5. Specific course information
   1. brief description of the content of the course (catalog description)
   2. prerequisites or co-requisites
   3. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program
6. Specific goals for the course
   1. Specific outcomes of instruction.
   2. Explicit indication of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
7. Brief list of topics to be covered.

# Appendix B – Faculty Vitae

**FOR THIS REPORT, ONLY RESUMES FOR THEFACULTY MEMBERS WHO TEACH ENGINEERING COURSES LISTED IN TABLE 5-1 ARE INCLUDED**

The information provided in the faculty vitae in this report is as follows.

1. Name
2. Education – degree, discipline, institution, year
3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate), timeline, full time or part time
4. Non-academic experience – company or entity, title, brief description of position, timeline, full time or part time
5. Certifications or professional registrations
6. Current membership in professional organizations
7. Honors and awards
8. Service activities (within and outside of the institution)
9. Brief list of the most important publications and presentations from the past five years
10. Brief list of the most recent professional development activities

# Appendix C – Equipment

**Not yet submitted** for Readiness Review.

# Appendix D – Institutional Summary

## The Institution

1. Universitas Hasanuddin

Jl. Perintis Kemerdekaan Km. 10, Makassar 90245

Sulwesi Selatan, Indonesia

1. The name of Chief Executive Office of the Institution (Rector):

Prof. Dr. Dwia Aries Tina Pulubuhu, MA.

1. Name and title of the person submitting the Report:

Prastawa Budi, PhD.

1. Universitas Hasanuddin is accredited by National Accreditation Agency for Higher Education (NAAHE), 2017

The Electrical Engineering Study Program (EESP) is accredited by National Accreditation Agency for Higher Education (NAAHE), 2017.

## Type of Control

The Universitas Hasanuddin is a state university with special status as Autonomous Public University under the Ministry of Research, Technology, and Higher Education (MORTHE or *PTNBH – Perguruan Tinggi Negeri Berbadan Hukum*).

## Educational Unit

The EESP is under the Department of Electrical Engineering (EE Department). The EE Department is under the Faculty of Engineering, and consist of Bachelor, Master and Doctoral study program, The EESP is the Bachelor study program, which is the educational unit that prepares this ABET Readiness Report. The ESSP is led by a chair of study program. The organizational chart of Hasanuddin University showing the departmental educational unit is presented in Figure D-1.



**Figure D-1** Organization Chart of Hasanuddin University.

## Academic Support Units

The following table lists the names and titles of the individuals responsible for each of the units that teach courses required by the program being evaluated for readiness, e.g., mathematics, physics, etc.

|  |  |  |
| --- | --- | --- |
| ***No.*** | ***Name of academic staff*** | ***Academic Support Courses*** |
| 1 | Dr. Syahruddin Kasim, SSi, MSi | Concept of Science and Technology |
| 2 | Dr.Ir, Muhammad Agung MP | Concept of Science and Technology |
| 3 | Dr.A.Baharuddin SH | Citizenship Education |
| 4 | Abdul Azis STP.M.Si | Citizenship Education |
| 5 | Abdur Rahman arif S.Si.,M.Si | Advanced Chemistry |
| 6 | Dr. Syahruddin Kasim, SSi, MSi | Advanced Chemistry |
| 7 | Dr.Paulus Lobo G M.Sc | Basic Physics |
| 8 | Prof.Dr.Syamsir Dewang MS | Basic Physics |
| 9 | Dr Munira Hasyim S.S.M.Hun | Bahasa Indonesia |
| 10 | Dr.Asriani Abbas m.Hum | Bahasa Indonesia |
| 11 | Dr.Firman, S.Si.,M.Si | Basic Mathematics |
| 12 | Andi Galsan Mahie, S.Si.,M.Si | Basic Mathematics |

## Non-academic Support Units

The names and titles of the individuals responsible for each of the units that provide non-academic support to the program, e.g. library, computing facilities, placement, tutoring are listed below.

|  |  |  |
| --- | --- | --- |
| ***No.*** | ***Name of Non-academic Staff*** | ***Non-academic Support Units*** |
| 1 | Risma Hidayani | Head of Administrative Staff |
| 2 | Salmiati, Hartika | Administrative Staff |
| 3 | Aris, Irsan | Administrative Staff |
| 4 | Budi | Laborant |
| 5 | Mustakim, ST | Laborant |
| 6 | Amsal Salim, ST | Laborant |
| 7 | Nompo | Laborant |
| 8 | Ikhsan, Tia, Ayu | Office Boy |

## Credit Unit

Using the 16-week semester, the semester credit hour, and the 50-minute class hour, Hasanuddin University course offerings are measured under the following guidelines.

**Credit Guidelines**

One semester credit hour is assigned in the following ratio of component hours per week devoted to the course of study:

**Non-Laboratory Instruction**

***Lecture, Recitation*** – Normally, one credit hour is associated with a class meeting for 50 minutes per week for an entire semester (or the equivalent 750 semester-minutes, excluding final exams). Another widely repeated standard states that each in-class hour of college work should require two hours of preparation or other outside work.

***Presentation*** – 1/2 credit hour is associated with a class meeting for 50 minutes per week for an entire semester (or the equivalent 750 semester-minutes, excluding final exam).

**Laboratory Class Instruction**

*Laboratory* – Normally, one credit hour is associated with a class meeting for 180 minutes per week for an entire semester (or the equivalent 2700 semester-minutes, excluding final exam, in other meeting formats).

***Lab Prep*** – One semester credit hour is associated with a class meeting 180 minutes per week over the semester.

***Studio***– One semester credit hour is associated with a class meeting 180 minutes per week over the semester.

**Independent Study**

***Experiential, Research, Individual Study*** –Credit hours associated with this type of instruction will be assigned credit depending upon the amount of activity associated with the course, faculty supervision, and students outside work activity.

***Non-Directed Study***

*Practice/Study/Observation* –No credit hours or staff effort are directly associated with these learning situations.

**Types of Credit Awarded in the Hasanuddin University System**

***Regular Credit:*** Credit earned for regularly offered collegiate courses of instruction that meet the requirements of a degree program.

It is assumed that one semester or quarter credit normally represents one class hour or three laboratory hours per week. One academic year normally represents at least 28 weeks of classes, exclusive of final examinations. If other standards are used for this program, the differences should be indicated.

***Thesis Credit:*** Credit awarded to students for research toward completion of a research project, or a degree thesis or dissertation. This credit allows measure of the expected amount of work and the resources used, while the student actually earns zero-degree credit hours. The benefit obtained is primarily to account for the resources provided, to use in reporting to governments, and in maintaining the students’ financial aid position. Example: Senior Research Project, Master’s Thesis, Doctoral Dissertation.

***Equivalent Credit:*** Hours are assigned to courses to reflect the value of resources used to provide the class, such as rooms, instructors, equipment, etc. Equivalent hours are used in the registration process but revert to zero when posted to the student’s academic history.

*Example:*

A seminar with a visiting professor, over and above existing degree requirements. The benefit obtained is primarily to account for the resources provided, to use in reporting to governments, and in maintaining the students’ financial aid position.

*Procedure for Exceptions*

Many situations and new developments may cause a given department or faculty member to vary from the guidelines listed above in the assigning of credit.

## Tables

The following tables are completed for the program undergoing the Readiness Review.

## Table D-1. Program Enrollment and Degree Data

**Electrical Enginering Studi Program (EESP)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Academic Year | | Enrollment Year | | | | | Total  Undergrad | Total  Grad | Degrees Awarded | | | |
|  | 1st | 2nd | 3rd | 4th | 5th | Associates | Bachelors | Masters | Doctorates |
| Current | 2018-2019 | FT | 110 | 84 | 66 | 82 | 75 | 372\*\* | 72 | N/A | S.T. (Sarjana Teknik) | N/A | N/A |
| Year | PT | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

\*Data provided until September 2018.

\*\*Data include the 6th and 7th year students

## Table D-2. Personnel

**Electrical Enginering Studi Program (EESP)**

Year1: 2018/2019

|  |  |  |  |
| --- | --- | --- | --- |
|  | HEAD COUNT | | FTE |
| FT | PT |
| Administrative2 | 2 | 0 | 4 |
| Faculty (tenure-track)3 | 48 | 0 | 48 |
| Other Faculty (excluding student Assistants) | 0 | 10 | 2,5 |
| Student Teaching Assistants4 | 0 | 20 | 2 |
| Technicians/Specialists2 | 4 | 0 | 8 |
| Office/Clerical Employees2 | 1 | 0 | 2 |
| Others2 (Office Boy) | 1 | 0 | 2 |

2) Administrative/Technicians/Specialists Staff FTE, 1 FTE = 20 hours/week

3) Faculty FTE, 1 FTE = 16 x 150 minutes/week = 40 hours/week

4) Student FTE, 1 FTE = 10 hours/week

## Signature Attesting to Compliance

Do **not** submit for Readiness Review.

1. **1**Giorgio Rizzoni, “Principles and Applications of Electrical Engineering”, Richard D. Irwin, Inc.,

   Burr Ridge, IL, USA, 1993 [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)