ASIIN Seal

Accreditation Report

Bachelor's Degree Program
Informatics Engineering Education

Master's Degree Programs
Electrical Engineering Education
Electronics and Informatics Engineering Education
Mechanical Engineering Education

Provided by
Universitas Negeri Yogyakarta

Version: 17.09.2021

Table of Content

A About the Accreditation Process

Name of the degree program (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Pendidikan Teknik Informatika	Informatics Engineering Education	ASIIN	/	04
Pendidikan Teknik Elektro	Electrical Engineering Education	ASIIN	/	02
Pendidikan Teknik Elektronika dan Informatika	Electronics and Informatics Engineering Education	ASIIN	/	02, 04
Pendidikan Teknik Mesin	Mechanical Engineering Education	ASIIN	/	01
Date of the contract: 22.07.2020 **Submission of the final version of the self-assessment report:** 09.03.2021 **Date of the onsite visit:** 02.07.2021 **Online**				
Peer panel: Prof. Dr.-Ing. Reinhard Moeller, University of Wuppertal Prof. Dr. Heribert Vollmer, University of Hannover Prof. Dr. Hanfried Hesselbarth, Zurich University of Applied Sciences Drs. Abdul Halim Samad, Principal SMK Telkom Makassar				

[1] ASIIN Seal for degree programs

[2] TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering; TC 02 - Electrical Engineering/Information Technology; TC 04 - Informatics/Computer Science

Tiara Yania Ifani Lakita, Hasanuddin University	
Representative of the ASIIN headquarter: Sophie Schulz	
Responsible decision-making committee: Accreditation Commission	
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering/Process Engineering as of December 9, 2011 Subject-Specific Criteria of Technical Committee 02 – Electrical Engineering/Information Technology as of December 9, 2011 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of March 29, 2018	

B Characteristics of the Degree Programs

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double / Joint Degree	f) Duration	g) Credit points / unit	h) Intake rhythm & First time of offer
Informatics Engineering Education	Pendidikan Teknik Informatika, Bachelor of Education	/	6	Full time	/	8 semesters	147 SKS, 238 ECTS	Per year; Since 2007
Electrical Engineering Education	Pendidikan Teknik Elektro, Master of Education	/	7	Full time	/	4 semesters	40 SKS, 66 ECTS	Per year; Since 2015
Electronics and Informatics Engineering Education	Pendidikan Teknik Elektronika dan Informatika, Master of Education	/	7	Full time	National Central University (NCU) of Taiwan	4 semesters	40 SKS, 66 ECTS	Per year; Since 2015
Mechanical Engineering Education	Pendidikan Teknik Mesin, Master of Education	/	7	Full time	/	4 semesters	40 SKS, 66 ECTS	Per year; Since 2015

[3] EQF = The European Qualifications Framework for lifelong learning

C Peer Report for the ASIIN Seal[4]

1. The Degree Program: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree program (intended qualifications profile)

Evidence:

- Diploma Supplement per program
- Curriculum per program
- Student handbook per program
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
Universitas Negeri Yogyakarta (UNY) has described and published program objectives (POs) and program learning outcomes (PLOs) for each of the four degree programs. The POs are based on the Indonesian qualification framework and serve as starting point in developing the PLOs and curricula of the study programs. The peers note that the relationship between POs and PLOs has been established in a comprehensible and logical manner. The development of POs and PLOs of the study programs involves both internal and external stakeholders so that the curricula can be adapted and modified according to the needs of the industry and the graduates on a regular basis. Internal stakeholders include all of UNY members (students, teaching staff, and non-academic employees), while the external stakeholders include the industry, vocational high schools, and professional associations.

The peers learn from the program coordinators and the university management that the main purpose of all four programs is to produce teachers, as they are much needed in the whole country. However, at the same time the programs also aim at producing graduates

[4] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

who will be able to work as engineers in the industrial/private sector. Moreover, the program coordinators emphasize that despite the educational focus of the programs, graduates of the three master's programs will also be able to become researchers, developers, designers, or consultants. In this regard, it is part of the university's future strategy to improve and further concentrate on research next to the focus on education.

At the end of their studies, graduates of the bachelor's program Informatics Engineering Education should be able to demonstrate profound knowledge of the basic concepts and principles of education, teaching quality, and curriculum development on the one hand, and at the same time have a deep understanding of the basic concepts and methods of science and engineering with a focus on informatics. In this regard, graduates should be able to provide education and teaching in the field of informatics engineering for prospective educators and educational personnel, and carry out research in order to further develop vocational education, technology, and informatics based products.

Graduates of the master's program Electrical Engineering Education should possess personal quality and professional ethics based on a scientific approach, be able to implement an approach of vocational education problems in electrical engineering based on a scientific study, know how to develop electrical power or industrial automation knowledge in vocational education and how to implement vocational and technical knowledge in electrical engineering in teaching and learning.

In the case of the master's program of Electronics and Informatics Engineering Education, graduates should have the capability to manage educational institutions, research projects, and businesses in the electronics and informatics engineering or a related field, and should be capable of developing concepts of education, research, and development in the fields of electronics engineering and information technology to be beneficial to education, teaching, and application of science and technology. Furthermore, graduates should be aware of their professional, ethical and social responsibility.

Graduates of the master's program Mechanical Engineering Education should be able to apply the relevant theoretical concepts in the field of engineering, metal fabrication, manufacturing drawings, design, engineering maintenance, and welding. They are capable of developing theoretical and practical concepts in the field of mechanical engineering vocational education. Moreover, they have acquired the necessary skills to conduct independent research in the field of mechanical engineering vocational education.

Next to the professional skills, the students of all four programs are supposed to acquire personal and social skills such as critical and creative thinking, communication skills, adaptability, the capacity to work in teams, and leadership skills. In addition, they should be able

to solve problems of engineering and vocational education through research and the application of different concepts and methods.

The peers agree that the bachelor's program adequately reflects level 6 of the European Qualification Framework (EQF) while all three master's programs are adequate to EQF level 7. The program objectives and learning outcomes of all four programs are consistent with the respective ASIIN Subject-Specific Criteria of the Technical Committees of Mechanical Engineering/Process Engineering, Electrical Engineering/Information Technology and Informatics/Computer Science. They aim at the acquisition of specific competences and are described in a brief and concise way. They are well-anchored, binding and easily accessible to all stakeholders.

Criterion 1.2 Name of the degree program

Evidence:

- Curriculum per program
- Self-assessment report

Preliminary assessment and analysis of the peers:
The titles of the degree programs follow the rules for naming study programs set by the Indonesian Ministry of Education. The expert panel considers the names of the study programs to be adequately reflecting the respective aims, learning outcomes, and curricula.

Criterion 1.3 Curriculum

Evidence:

- Curriculum per program
- Student handbook per program
- Module handbook per program
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
The curricula of the degree programs are designed to match the POs and PLOs and to that end, they are continuously examined and revised. In the self-assessment report and the curriculum for each program, UNY describes in detail how the PLOs of each program are to be achieved in the individual modules and thus explains the significance of each module for the program as a whole. The curricula are reviewed by the panel in order to identify whether the described learning objectives can be achieved by the available modules.

Course descriptions as well as matrices matching the general learning objectives and the module contents were provided for a detailed analysis. The discussions during the online visit reveal that the current curricula are in a constant revision process and that several modifications have already been made in recent years.

The bachelor's degree program consists of 8 semesters, each with a duration of 16 weeks. The first six semesters contain so-called common courses, basic educational courses, as well as specific courses dependant on the chosen degree program. The seventh semester entails the community service of the students as well as an internship. The eighths semester is dedicated to the undergraduate thesis. The common courses are set by the university and are mainly designed to achieve learning outcomes within the attitudes domain as well as generic skills of the students such as English speaking competencies.

The three master's degree programs consist of 4 semesters, comprising common courses on foundational science offered the Graduate School of UNY, compulsory specific courses that are set and organized by each study program including graduate thesis, elective and compulsory elective courses for specialization.

All in all, the peers have a very good impression of the curricula of all four programs. By thoroughly analyzing the module descriptions and following the discussions during the online visit, the peers state that the four programs are coherent, well-structured and cover the essential topics in the respective field, enabling also an individual profile building through various elective courses. The only thing the peers note is that the number of foundational/theoretical courses (in particular mathematics and theoretical computer science) is rather low, especially looking at the bachelor's program. To be precise, the bachelor's program contains two math modules ("Mathematics" and "Discrete Mathematics") and only one module in theoretical computer science ("Logic"), which is why the peers discuss in detail how the students acquire the theoretical basics in order to be able to successfully complete the other courses building upon these basics. They learn from the program coordinators that most of the basic knowledge is imparted in the programming courses. While this explanation is generally convincing, especially since the proportion of programming courses is comparatively large, the peers nevertheless suggest reviewing whether and in how far foundational knowledge could be conveyed in a larger number of independent modules, covering more mathematical and theoretical contents such as formal languages and complexity. Similarly, it would be advisable for the three master's programs to consider including a course on object oriented modelling.

The peers also discuss the practical experience of the students. They learn that all bachelor students have to undertake a community service that is mandatory in Indonesian HEIs and

that is aimed to provide experiences to apply their knowledge while at the same time supporting Indonesian society. Next to the community service, all bachelor students have to complete a four-month field practice, consisting of the teaching practice at partner schools and the industrial internship at companies. The teaching practice allows students to gain knowledge about designing lesson plans, teaching in a real classroom environment, and to perform classroom assessments. The purpose of the industrial internship is to apply the acquired theoretical knowledge in practice. The field practice is supervised by one representative from UNY to ensure that students gain the necessary skills. The peers appreciate that all bachelor students have to complete a compulsory practical training, especially also because they gain very valuable soft skills during this phase. However, the peers regret that such practical training is not integrated in the curricula of the three master's programs. Although they learn that many students work in companies next to their studies or decide to conduct the master's theses in collaboration with a company, the peers would very much appreciate if the three master's programs included a mandatory practical training in the industry sector as well, in particular because a significant proportion of the master's graduates are planning to or already pursuing a career in the industry instead of becoming a vocational teacher.

Criterion 1.4 Admission requirements

Evidence:

- Self-assessment report
- UNY Academic Regulation

Preliminary assessment and analysis of the peers:
Student admission for all degree programs at UNY is managed through the admission office. Regarding the admission process itself, different systems are applied for undergraduate programs and graduate programs. For the undergraduate programs, there exist three pathways for student admission:

1. SNMPTN (National Entry Selection of Public Universities), based on academic performance during high school (40%)
2. SBMPTN (Joint Entry Selection of Public Universities), based on a nationwide selection test that is held every year for university candidates (40%)
3. Mandiri Selection (independent selection), these students are selected under special consideration of their education, local origin, social background, achievements in sports or science, and financial means

Unlike the undergraduate programs, the admission for the master's programs does not entail an entrance test at the national level. Instead, student admissions are independently

held at UNY. In order to be admitted to the master's programs, the applicants must hold an undergraduate degree in the respective field with a minimum GPA of 3.00 and must proof adequate English language skills. Admission to the master's programs can be done through a portfolio-based or computer-based test, which are both managed independently by UNY and can be carried out once per semester.

All information regarding admission, including its requirements and its procedures, are available on UNY's website and are anchored in the "Academic Regulations of UNY", among others. In summary, the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

Curriculum

The peers acknowledge that UNY is planning to integrate more contents on formal language theory and automata theory in the module "Engineering Mathematics".

Regarding practical training in the industry sector in the master's programs, improving the curricula will focus on the elective courses to accommodate the students' interest in industrial sectors, namely industrial innovation projects.

The peers consider criterion 1 to be completely fulfilled.

2. The degree program: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- UNY Academic Regulation
- Module handbook per program
- Curriculum per program
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
After analyzing the module descriptions and the curricula, the peers confirm that all degree programs under review are divided into modules and that each module is a sum of coherent teaching and learning units. All working practice intervals (community service and field training) are well integrated into the curriculum, and the supervision by the faculty allows for their respective quality in terms of relevance, content, and structure. In addition, the peers gain the impression that the choice of modules and the structure of the curricula ensure that the intended learning outcomes of all four degree programs can be achieved.

To allow students to complete the degree without exceeding the regular study duration, the courses are distributed proportionally over eight semesters in the bachelor's and four in the master's program by considering prerequisites for higher-level courses. In addition to prerequisites, a balance between the different types of courses (e.g. common courses, educational courses, subject-specific courses) is also considered.

After analyzing the curricula, the peers notice that each module consists of one course and that therefore there exist many small modules. UNY states that they are in the process of creating a more compact curriculum based on the example of the European model, yet this may take some time. To minimize the workload, however, it is guaranteed that no more than two exams are held per day. Overall, the peers regard the module structure to be adequate.

International Mobility

The peers also discuss in detail about international mobility and note that, although actively promoted by the program coordinators, it is still very limited. UNY tries to promote international mobility by offering scholarships and creating partnership agreements with other universities. In particular, UNY has established an optional double degree program within the master's program Electronics and Informatics Engineering Education with the National Central University (NCU) of Taiwan in 2019. The double degree program aims to enhance and develop student mobility in terms of increasing the competitiveness of Indonesian universities globally. Is is also intended to promote the exchange of knowledge between Indonesian universities and overseas universities. Students who opt for the double degree program spend the first year of their studies at UNY and complete their second year in at NCU Taiwan. The courses taken at NCU are fully recognized at UNY and vice versa, and UNY provides a detail explanation of the course conversion in the self-assessment report. Since the introduction of the double degree program, about 6 students (2-3 per year) have taken this opportunity.

The peers welcome that UNY offers support to the students with regard to studying abroad, yet the numbers remain low in comparison to the number of students enrolling each year.

UNY has recognized that there is a serious need for increasing the academic mobility of their own students and, at the same time, for attracting more international students. The peers support the first steps undertaken to strengthen international mobility, and in particular acknowledge that next to financial support and available partnership agreements, UNY offers a pre-departure training of 2-3 months for outgoing students in order to minimize the cultural and academic shock. Nevertheless, they are convinced that even more measures can be taken in order to support the internationalization of UNY, especially since UNY aims at becoming an internationally recognized university. For example, they would much appreciate if more classes were taught solely in English and more partnership agreements could be undertaken, especially with countries outside of Asia. The peers inquire whether offering more courses taught in English would help to attract more international students and learn that UNY is in the process of creating more courses in English but that they also offer courses for international students to learn Bahasa Indonesia. The peers appreciate that a variety of courses are already taught bilingually and understand that increasing the number of English speaking courses might still take some time, as not all teachers are able to hold classes in English so far (see also criterion 4.2). Overall, the peers recommend to further foster international mobility by introducing additional measures, in particular strengthening the English language both in the curricula and among the teaching staff.

Criterion 2.2 Work load and credits

Evidence:

- Module handbook per program
- Curriculum per program
- UNY Academic Regulation
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:

According to Indonesian regulation, each undergraduate degree comprises 144 Indonesian credits (sks) over the span of eight semesters, while each graduate degree covers 42 sks in four semesters. According to the Academic Regulations of UNY, 1 sks is equivalent with 170 minutes of student activity per week within one semester. When converting to ECTS, 1 ECTS equals 27.5 - 28.3 hours of student activity per semester, which the peers deem sufficient. Each study program has the independence to determine the course distribution according to applicable regulations so that the workload semester will also be different for each program. The credit load taken by students in one semester is based on the GPA score in the

previous semester. The maximum number of credits that can be taken is based on the GPA score. The program coordinator authorizes the student's academic supervisor to assist students in planning the study load for the next semester. The results of student studies and the courses offered serve as a reference in determining the number of credits a student will take.

The peers confirm that the workload in hours is indicated in the module descriptions and the distinction between classroom work and self-studies is made transparent and is in line with the credits awarded. At the end of each semester, the students' workload for every course is monitored and evaluated.

During the discussions with the students, the peers learn that they deem the workload as well as the number of exams to be adequate and that they still find time to develop their individual interests and skills outside of the university by working or taking extracurricular classes.

The peers believe the overall workload to be manageable, especially since nearly all students graduate on time.

Criterion 2.3 Teaching methodology

Evidence:

- Module handbook per program
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:

UNY has implemented various teaching and learning methods, which mainly focus on student-centered learning. As such, the use of teaching methodology and media are adjusted to the characteristics of each course and its learning objectives and learning outcomes. The learning methods commonly used in the four programs are lectures, group discussions, simulations, case studies, collaborative learning, cooperative learning, problem-based learning, project-based learning, and self-regulated learning. Each course may use one or a combination of several learning methods. The applied learning method(s) in a module are clearly stated in the respective module description. The peers are especially impressed with the different online teaching tools. For example, UNY has launched "Be-Smart", an online platform designed for e-learning activities to improve the flexibility of learning processes and the interaction between students and lecturers. More and more courses are added to this platform offering material or additional information and exercises online. They assert,

however, that Be-Smart is only used in addition to traditional face-to-face lectures, although its use has naturally been increased during the pandemic.

In summary, the peers are very impressed with the various teaching methodologies, both traditional and modern, that are utilized in the four degree programs under review. They deem them suitable to support the students in achieving the intended learning outcomes.

Criterion 2.4 Support and assistance

Evidence:

- Self-assessment report
- Dicussions during the online audit

Preliminary assessment and analysis of the peers:
In order to support students in completing their studies on time with good achievements, the university and the faculty provide academic and personal support and assistance through various means: First, students are appointed an academic supervisor during their first semester, which supports them with devising their study plan and monitors the student's academic progress. Additionally, each student is also appointed a thesis supervisor, who supports him or her in the process of writing the bachelor's or master's thesis. Second, there exist special supervisors who help those students that are interested in extracurricular activities related to their studies. The peers appreciate that each student has one personal supervisor that guides and aids him or her throughout the entire studies and also that the university provides support for those extracurricular activities that can further the students' career.

In addition to the aforementioned academic support, UNY also provides student counselling services and medical center services for personal problems a student might face. Students' interests and talents are furthermore facilitated through several centers, such as the career development center or the scholarship information portal. In order to provide students with sufficient information about the available support and assistance, UNY distributes a Student Handbook that is regularly updated. All necessary information can also be found on UNYs websites.

The peers notice the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice, and support for all students. The support systems help the students to achieve the intended learning outcomes to complete their studies successfully and without delay.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

Internationalization

In its statement, UNY emphasizes that the continuous improvement of collaborations with overseas universities, either in Asia or outside Asia has a high priority, in particular in terms of student exchange programs, dual degree programs, visiting professors, and joint research projects/publications. In order to further promote the internationalization process, the peers propose to maintain their respective recommendation.

English skills

In its statement, UNY points out that it provides some specific facilities to improve the English skills of its lecturers and students, such as the English language center. Moreover, UNY is planning to arrange some course materials to be delivered fully English, which, in turn, should improve the English skills of both lecturers and students. The peers welcome these plans and suggest to maintain their initial recommendation until its practical implementation.

The peers consider criterion 2 to be completely fulfilled.

3. Exams: System, concept and organisation

Evidence:

- Self-assessment report
- Module handbook per program
- UNY Academic Regulation

Preliminary assessment and analysis of the peers:
At UNY, assessment is conducted according to the regulations defined in the Quality Assurance of Assessment as well as the Academic Regulations. Each course determines course objectives to support the achievement of the program learning outcomes. Accordingly, each course must assess whether all defined learning outcomes stated in the module description have been achieved. If a student fails an exam, he or she may repeat it, either within the semester (in the case of failed mid-term exams), after the end of the semester (in the case of failed final exams), or during the next semester. There is no limitation on how often an exam can be re-taken.

The assessment system at UNY has two purposes: a formative and a summative purpose. The formative assessments are used by the lecturer to monitor the progress of achieving

the course objectives and usually take place in the middle of the semester. If the lecturer notices that students are not able to achieve the course objectives to the fullest, he or she will adapt the taught contents accordingly. The summative assessments are used to display whether the course objectives have been met at the end of each semester.

All final exams take place within a certain timeframe at the end of each semester. This timeframe (exam weeks) is communicated at the beginning of each academic year. Before the exam week there is a preparatory week offered for students to prepare intensively for their final exams. About two weeks prior to the exam weeks, a detailed schedule is published that informs about the exact time and date when each exam takes place. During the first meeting of each course, the students are informed about the form, the date, the relevant regulations, and the weight of the individual exam for the final grade. Assessment of the students' attitudes, which are part of the overall program learning outcomes, are conducted through observation and documentation by the lecturers. Assessments of knowledge are conducted via quizzes at the end of each unit as well as mid-term and final exams. Assessments are carried out in various forms such as written tests, oral presentations, portfolios, quizzes or projects. In addition to the course assessments, undergraduate students are required to complete a final project in the form of a bachelor's thesis; likewise, master's students are required to complete a final project in the form of a master's thesis.

The students confirm that a variety of assessment methods is used, including traditional methods such as written or oral exams, but also presentations or project reports are utilized. Next to the mid-term and the final exams, students also have some quizzes and projects throughout the semester that all count towards the final module grade. Although this means that the total number of tests taken during a semester is comparatively high, the students do not complain at all about this workload and instead confirm that taking several exams for one course allows for a continuous learning process.

A few weeks before the online visit, the peers were provided with a selection of exams and final projects to check. They confirm that these represent an adequate level of knowledge as required by the EQF level 6 for the bachelor's program and EQF level 7 for the three master's programs. In conclusion, the peers note that all relevant examination regulations are in place and well communicated in a transparent way. The forms of exams are oriented toward the envisaged learning outcomes of the respective courses, and the workload is distributed in an acceptable way.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The peers consider criterion 3 to be completely fulfilled.

4. Resources

Evidence:

- Staff handbook per program
- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
At UNY, the staff members have different academic positions. There are professors and lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, there are lecturers who hold a Master's degree and lecturers who hold a PhD degree. The latter may become professors once they have earned a certain amount of credits with regard to their academic work. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position.

In the four programs under review, the percentage of lecturers with a PhD is 76.8 %, while the remaining 23.2 % have a master's degree. Compared with the number of active students in 2020, the adequacy ratio of lecturers and students is in accordance with the Regulation of the Minister of Research, Technology and Higher Education Number 2/2016 where the ratio of student lecturers in the field of engineering is 1:20. The four programs are implemented by 56 teaching staff members in total, out of which 9 are full professors, 34 hold a doctorate and 13 a master's degree.

In summary, the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programs. The auditors are impressed by the excellent and open-minded atmosphere among the students and the staff members. Both confirm that in case of questions or problems, there is always an academic advisor available to solve the issues together with the student. The academic staff is supported by the administrative and technical employees at department, faculty, and university level.

Criterion 4.2 Staff development

There are offers and support mechanisms available for teaching staff who wish to further develop their professional and teaching skills.

Evidence:

- Self-assessment report
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
According to the self-assessment report, staff-development is carried out on a regular basis to improve the quality, competence, and performance of the teaching staff. The staff-development activities include guest lectures, research and publication, monitoring and evaluation. Developing human resources is part of the main strategy of the university with the overall aim of increasing the number of lecturers who hold a PhD (ideally, all of them should do their doctorate in the near future). All lecturers are encouraged to do regular training and to work, study or conduct research abroad for a certain time. In doing so, the university is able to provide funding for everyone interested, as it receives substantial financial support from the national ministry in this field, so that the financial resources for staff mobility are generally very good. However, the peers learn that the number of staff members taking this opportunity is still very limited by the time of the online audit. One of the reasons for the relatively little interest in international exchange is the language barrier, as a comparatively large number of staff members does not have sufficient English language skills. Moreover, the number of partnerships with international universities and companies is still limited and the peers are convinced that extending these collaborations would also attract more staff members to participate in staff exchange programs.

With regard to research activities, all lectures have the opportunity to apply for grants, which they usually receive from the government. Furthermore, the university holds coaching for lecturers aiming to participate in international conferences or improving their academic writing skills. The peers acknowledge that the teachers tend to include students into their research work, thus effectively merging their research and teaching responsibilities.

The peers further ask whether lecturers have the possibility of taking a sabbatical. They learn that a sabbatical has just recently been implemented by the Indonesian Ministry of Education so that from now on, lecturers may spend 4-6 months abroad or in the industry while receiving their full salary. However, in practice, real sabbaticals do not exist by the time of the audit and have yet to be established.

In summary, the peers confirm that UNY offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and educational skills. Nevertheless, they make the point that for reasons of internationalization the university should extend its international activities, in particular in terms of international partnerships and staff exchange, and in this regard emphasize the importance of continuously improving the average English language skills among the teaching staff.

Criterion 4.3 Funds and equipment

Evidence:

- Self-assessment report
- Video material
- Discussions during the online audit

Preliminary assessment and analysis of the peers:
As UNY is a public university, it is funded by the Indonesian government as described in the Activity and Budget Plan (RKA). The funds noted in the RKA consist of three components: (1) education and teaching, research, and community service, (2) infrastructure, and (3) financing for academic and non-academic activities for student services.

In the self-assessment report, UNY gives an extensive overview of the available learning spaces and libraries, including the digital libraries. Moreover, they list detailed information of all laboratories available per study program. Due to the ongoing Covid-19 pandemic, it is not possible for the peer panel to travel to Indonesia and visit UNY in person. Therefore, the university has provided the peers with a professional video showing its campus with some central facilities, relevant research and teaching facilities and, in particular, all the different laboratories available for the four study program. The peers are very impressed by the range of learning tools and resources available to the students. They consider the university's facilities and available equipment in the labs to be of highest standards and are convinced that the laboratories adhere to the international safety standards. The relatively newly constructed premises are spacious and offer ample opportunities for the professional and individual development of students and teachers. The students confirm that they are provided with all relevant software and are given easy access to all necessary rooms and equipment.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

English skills

See criterion 1.

The peers consider criterion 4 to be completely fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions per program

Preliminary assessment and analysis of the peers:
The module descriptions are published on UNY's website in both Bahasa Indonesia and English, so that students and stakeholders can access them at any time.

After studying the module descriptions, the peers confirm that they include all necessary information about the persons responsible for each module, the teaching methods and work load, the credit points awarded, the intended learning outcomes, the applicability, the admission and examination requirements, and the forms of assessment as well as details explaining how the final grade is calculated.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Sample Diploma Supplement per program

Preliminary assessment and analysis of the peers:
With the successful completion of their studies, the students receive a diploma, an academic transcript, and a diploma supplement. The diploma supplements are bilingual (Bahasa Indonesia and English) and contain all relevant information on the student's qualifications profile and individual performance as well as the classification of the degree program with regard to its applicable education system.

Criterion 5.3 Relevant rules

Evidence:

- UNY Academic Regulation
- Regulation of the Minister of Research, Technology, and Higher Education of the Republic of Indonesia Concerning Nomenclature of Study Programs in Higher Education
- Regulation of the Minister of Research, Technology, and Higher Education of the Republic of Indonesia Concerning the National Standards of Higher Education
- Regulation of the Minister of Research, Technology, and Higher Education of the Republic of Indonesia on Diploma, Certificate of Competency, Certificate of Profession, Degree and how to write Academic Degree in Higher Education Institution
- Government Rule – National Student Admission

- Government Rule – Teacher and Lecturer
- Government Rule – Career Development
- Regulations regarding Student Mobility and Guidelines on Credit Transfer

Preliminary assessment and analysis of the peers:
The peers confirm that the rights and duties of both UNY and the students are clearly defined and binding. All rules and regulations are published on the university's website and hence are available to all relevant stakeholders.

In addition, students receive all relevant course materials in the language of the degree program at the beginning of each semester.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The peers consider criterion 5 to be completely fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-assessment report
- Online audit

Preliminary assessment and analysis of the peers:
From the very thorough documentation within the SAR, it becomes obvious to the peers that UNY has a multifaceted quality management system that aims at a constant development and improvement of the procedures, the programs and all individual stakeholders. The university applies both external and internal quality assurance. The external quality assurance is implemented by the Indonesian Accreditation Body, BAN-PT, while UNY's internal quality assurance is managed by the Institute for Quality Assurance and Educational Development.

Internal quality assessment of the degree program is carried out through internal audits and evaluations. The internal audit is conducted every year by UNY's internal auditors. In addition, monitoring and evaluating of all courses is carried out through a survey of university service satisfaction, which involves students, lecturers, and academic staff. UNY stu-

dents are asked to participate in surveys both at the beginning and at the end of each semester through an electronic evaluation system. Giving feedback on the classes is compulsory for all students. The survey taking place at the beginning of the semesters aims at assessing the general description of a course, such as the course objectives, the course material (including literature) and the types and methods of student assessment. By participating in the survey taking place at the end of the semester, students get the chance to evaluate the course and the teacher in hindsight and check whether their expectations from the survey at the beginning of the semester have been met throughout the course. To do so, they assess the course contents, the different material used and the teaching methodologies applied, amongst others. The data obtained from the course evaluations are used to assess the implementation of the teaching and learning process such as the number of meetings and the teaching and assessment methods. Derived from the evaluation results presented in the SAR, the peers get the impression that all four study programs have a good quality in terms of teaching-learning processes and academic services. At the end of each semester, the students' achievement of the PLOs is evaluated based on their grades in the categories of participation, assignments, mid-term exam and final exam. The curricula and program objectives are revised at least every 4-5 years in order to keep up with the rapid technological progress. To do so, the program coordinators invite different stakeholders from both industry and vocational schools to involve them in the continuous development of their programs.

In the various discussion rounds during the online visit, all stakeholders, and in particular teaching staff and students, confirm that the quality management system is working very well in practice. The students report that they regularly participate in the different evaluations explained above and that there are a number of student organizations at UNY that are deeply involved in the different quality management processes. The peers expressly welcome the sophisticated and efficient quality management system and in particular the well-established electronic monitoring system with its online surveys. Although all actors involved confirm that the quality management is working well, the peers would very much like to see the electronic evaluation process to be more formalized, as it is not yet anchored in a binding document by the time of the online audit. The peers inquire in which way the students are informed about the results of the course evaluations and the actions taken based on these results. Although the feedback loops are generally closed by sharing evaluation results and potential actions with the student organizations, the peers learn that they are not necessarily further discussed, and therefore recommend to also involve the other students (those that are not members of the student organizations) more actively in the process of continuous improvement of the programs, by discussing evaluation results during classes and deriving possible improvement measures together, where possible.

The peers welcome that UNY also conducts tracer studies with graduates and industry partners to assess the overall program afterwards and also their reputation and possibilities on the labor market after the completion of studies, aimed at adapting the programs according to the requirements of the job market and the graduate competencies. Therefore, the tracer study is intended to get assessment results and input from future employers (including graduate competencies, profiles of graduate qualifications, and suggestions for curriculum improvement) and alumni (including graduate mobility, graduate job profile, graduate waiting period, study program academic eligibility, and input to the curriculum). The tracer study results are then used to improve the overall quality of the programs, placing a special emphasis on learning outcomes and curriculum structure. In conclusion, the peers are convinced that the quality management system at UNY is well functioning and under constant review and permanent improvement.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

Evaluation

The peers acknowledge that the electronic monitoring and evaluating processes are electronically conducted referring to the formal document of UNY's academic regulation and UNY's Internal Quality Assurance System Standard, although the individual steps of the process could still be explained in more detail.

Regarding the involvement of other students (those that are not members of the student organizations), UNY emphasizes that it offers opportunities to students to give feedback related to the study program performance through various means. Moreover, the student associations at UNY and the respective faculties conduct regular meetings where they invite all students to give an evaluation of their study program performance.

The peers consider criterion 6 to be completely fulfilled.

D Additional Documents

No additional documents needed.

E Comment of the Higher Education Institution (31.08.2021)

The institution provided a short statement on the report.

F Summary: Peer recommendations (10.09.2021)

Taking into account the university's statement on the report, the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Program	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Informatics Engineering Education	Without requirements	/	30.09.2027
Ma Electrical Engineering Education	Without requirements	/	30.09.2027
Ma Electronics and Informatics Engineering Education	Without requirements	/	30.09.2027
Ma Mechanical Engineering Education	Without requirements	/	30.09.2027

Recommendations for the applied label

Recommendations

For the Bachelor's degree program

E 1. (ASIIN 1.3) It is recommended to integrate more foundational courses, covering in particular mathematical basics and aspects of theoretical computer science.

For the Master's degree programmes

E 2. (ASIIN 1.3) It is recommended to integrate at least one mandatory practical training in the industry sector into the curricula.

For all degree programmes

E 3. (ASIIN 1.3; 2.1; 4.2) It is recommended to promote the internationalization process, in particular in terms of international partnerships, student mobility, and staff exchange.

E 4. (ASIIN 1.3; 2.1; 4.2) It is recommended to increase the use of English both within the curricula and among teaching staff.

E 5. (ASIIN 6) It is recommended to increase student involvement in the quality assurance process by discussing evaluation results and potential actions with all students.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering/Process Engineering (06.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the peers without any changes.

The Technical Committee 01 – Mechanical Engineering/Process Engineering recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Mechanical Engineering Education	Without requirements	30.09.2027	–	–

Technical Committee 02 – Electrical Engineering/Information Technology (03.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the peers without any changes.

The Technical Committee 02 – Electrical Engineering/Information Technology recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ma Electrical Engineering Education	Without requirements	30.09.2027	–	–
Ma Electronics and Informatics Engineering Education	Without requirements	30.09.2027	–	–

Technical Committee 04 – Computer Science/Informatics (10.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the decision of the peers without any changes.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Informatics Engineering Education	Without requirements	30.09.2027	–	–
Ma Electronics and Informatics Engineering Education	Without requirements	30.09.2027	–	–

H Decision of the Accreditation Commission (17.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses the procedure and follows the decision of the peers and the Technical Committees without any changes.

The Accreditation Commission decides to award the following seals:

Degree Program	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
Ba Informatics Engineering Education	Without requirements	/	30.09.2027
Ma Electrical Engineering Education	Without requirements	/	30.09.2027
Ma Electronics and Informatics Engineering Education	Without requirements	/	30.09.2027
Ma Mechanical Engineering Education	Without requirements	/	30.09.2027

Recommendations

For the Bachelor's degree program

E 1. (ASIIN 1.3) It is recommended to integrate more foundational courses, covering in particular mathematical basics and aspects of theoretical computer science.

For the Master's degree programmes

E 2. (ASIIN 1.3) It is recommended to integrate at least one mandatory practical training in the industry sector into the curricula.

For all degree programmes

E 3. (ASIIN 1.3; 2.1; 4.2) It is recommended to promote the internationalization process, in particular in terms of international partnerships, student mobility, and staff exchange.

E 4. (ASIIN 1.3; 2.1; 4.2) It is recommended to increase the use of English both within the curricula and among teaching staff.

E 5. (ASIIN 6) It is recommended to increase student involvement in the quality assurance process by discussing evaluation results and potential actions with all students.

Appendix: Program Learning Outcomes and Curricula

According to the Curriculum the following **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree program Informatics Engineering Education:

1. Graduates are able to apply obedience to God Almighty in carrying out tasks.

2. Graduates are able to develop collaborative networks with stakeholders.

3. Graduates show discipline and independence in work and quality work results.

4. Graduates master broad and in-depth knowledge of the basic concepts of science and engineering.

5. Graduates master in-depth knowledge of basic education concepts, educational principles, and learning to improve teaching quality.

6. Graduates are able to demonstrate practical communication skills with stakeholders.

7. Graduates are able to show social awareness and sensitivity to disseminate society and the surrounding environment.

8. Graduates are able to apply the knowledge and skills they have to make the right decisions to solve a problem at work.

9. Graduates know the concepts of curriculum development, learning, and in-depth learning assessments.

10. Graduates are able to design information systems, multimedia, and computer networks in the field of information technology.

11. Graduates could implement and analyze information systems, multimedia, and computer networks.

12. Graduates are able to analyze current issues and problems to provide solutions in the use of technology.

The following **curriculum** is presented:

Code	Course	PLO											
		1	2	3	4	5	6	7	8	9	10	11	12
SEMESTER 1													
MKU6301	Islam Education	v											
MKU6302	Catholic Education	v											
MKU6303	Christianity Education	v											
MKU6304	Hinduism Education	v											
MKU6305	Buddhism Education	v											
MKU6306	Confucianism Education	v											
PTI6226	Mathematics				v								
PTI6201	Introduction to Information Technology				v								
PTI6202	Programming 1				v								
PTI6203	Programming Laboratory Work 1				v								
PTI6204	Digital Electronics									v			
PTI6205	Digital Electronics Laboratory Work									v			
PTI6206	Logics				v								
PTI6208	Computer System Organization								v				
MKU6212	Digital Transformation				v								
SEMESTER 2													
MKU6214	Social and Cultural Education							v					
PTI6207	Computer Assembly and Installation									v			
PTI6209	Programming 2				v								
PTI6210	Programming Laboratory Work 2				v								
PTI6211	Operation Systems								v				
PTI6221	Data Structures								v				
PTI6122	Data Structures Laboratory Work								v				
PTI6214	Networking								v				
PTI6215	Networking Laboratory Work								v				
PTI6216	Web Programming									v			
PTI6217	Discrete Mathematics				v								
SEMESTER 3													
MDK6201	Science of Education					v							

Code	Course	PLO											
		1	2	3	4	5	6	7	8	9	10	11	12
MDK6303	Educational Management					v							
PTI6218	Data Communication									v			
PTI6219	Data Communication Laboratory Work									v			
PTI6220	Visual Programming 1									v			
PTI6212	Programming Algorithm				v								
PTI6213	Programming Algorithm Laboratory Work				v								
PTI6223	Database								v				
PTI6224	Database Laboratory Work								v				
MDK6202	Educational Psychology					v							
FTE6201	Technology and Vocational Education									v			
PTI6225	Multimedia Based Instruction									v			
SEMESTER 4													
MKU6211	English						v						
PTI6228	Software Engineering								v				
PTI6130	Decision Support Systems										v		
PTI6231	Decision Support Systems Laboratory Work										v		
PTI6134	Visual Communication Design										v		
PTI6235	Visual Communication Design Laboratory Work										v		
PTI6136	Mobile and Cloud Computing Architecture										v		
PTI6237	Mobile and Cloud Computing Architecture Laboratory Work										v		
PTI6238	Security Systems								v				
FTE6202	Curriculum Development									v			
FTE6203	Vocational Learning Strategy									v			
MKU6209	Indonesian Language						v						
MKU6208	Pancasila							v					
MKP6301	Educational Research Methodology					v							
FTE6205	Vocational Curriculum Development									v			
SEMESTER V													
MKU6207	Civic Education			v									

Code	Course	PLO											
		1	2	3	4	5	6	7	8	9	10	11	12
MDK6204	Educational Sociology and Anthropology					v							
PTI6240	Modelling and Simulation								v				
PTI6241	English for Engineering						v						
PTI6242	Human Computer Interaction								v				
PTI6143	Animation										v		
PTI6244	Digital Image Processing Laboratory Work										v		
PTI6145	Mobile Application Development											v	
PTI6246	Mobile Application Development Laboratory Work											v	
PTI6147	Wireless Communication											v	
PTI6248	Wireless Communication Laboratory Work											v	
PTI6249	Management Information System										v		
PTI6250	Management Information System Laboratory Work										v		
PTI6251	Network Administration										v		
PTI6252	Network Administration Laboratory Work										v		
PTI6253	Interactive Multimedia											v	
PTI6254	Interactive Multimedia Laboratory Work											v	
PTI6263	Scripting Language										v		
PTI6264	Scripting Language Laboratory Work										v		
PTI6265	Voice and Network Video											v	
PTI6266	Voice and Network Video Laboratory Work											v	
PTI6267	Web Design											v	
PTI6268	Web Design Laboratory Work											v	
PTI6356	Microteaching									v			
SEMESTER 6													
PTI6226	Project Management												v
MKU6212	Entrepreneurship								v				
PTI6269	Statistics				v								
FTE6206	Career Development			v									
PTI6255	Individual Project												v
PTI6257	Object Oriented System Development										v		

Code	Course	PLO											
		1	2	3	4	5	6	7	8	9	10	11	12
PTI6258	Object Oriented System Development Laboratory Work										v		
PTI6259	Distributed Network										v		
PTI6260	Distributed Network Laboratory Work										v		
PTI6232	Computer Game for Education											v	
PTI6233	Computer Game for Education Laboratory Work											v	
PTI6269	Artificial Intelligence										v		
PTI6270	Artificial Intelligence Laboratory Work										v		
PTI6271	Internet of Thing										v		
PTI6272	Internet of Thing Laboratory Work										v		
PTI6273	Broadcasting										v		
PTI6274	Broadcasting Laboratory Work										v		
SEMESTER 7													
MKU6313	Community Services		v										
FTE6309	Industrial internship		v										
PEN6601	Teaching Practice		v										
SEMESTER 8													
MKP6602	Undergraduate Thesis												v
		6	3	2	12	5	3	2	13	13	24	12	3

According to the Curriculum the following **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree program Electrical Engineering Education:

Programme Learning Outcomes (PLO)	
PLO1	Demonstrate professional ethics based on religious values, patriotism, and academic norms
PLO2	Implement vocational education and engineering based on scientific approach
PLO3	Analyse vocational education and engineering through scientific research
PLO4	Develop vocational education knowledge of electrical engineering in the competency of power or industrial automation based on information technology
PLO5	Develop knowledge of electrical engineering in the competency of power or industrial automation in vocational education based on information technology
PLO6	Publish research of vocational education in electrical engineering through national and international levels
PLO7	Demonstrate critical and creative thinking skills, communication, adaptability, and leadership
PLO8	Implement strategy, model, method, media, learning material, evaluation, and learning assessment in vocational education based on information technology
PLO9	Apply electrical engineering theory in vocational teaching and learning in the competency of power or industrial automation based on information technology

The following **curriculum** is presented:

NO.	SUBJECT CODES	SUBJECTS	NUMBER OF CREDIT SYSTEMS			SEMESTER AND NUMBER OF CREDIT SYSTEM				TOTAL OF CREDIT SEMESTER
			(UMBERS	THEORY	PRACTICE	1	2	3	4	
I. FOUNDATION SUBJECTS OF SCIENCE										
1	PPS 8201	Philosophy of Science	**2**	2		2				
2	PPS 8202	Statistics	**2**	2			2			**7**
3	PPS 8304	Methodology of Educational Research	**3**	3		3				
		Number of Credit	**7**	**7**		5	2			
II. EXPERTISE SUBJECTS [COMPULSORY]										
1	EKO 8201	Vocational Education	**2**	2		2				
2	EKO 8202	E-Instructional of Vocational Education	**2**	2		2				
3	EKO 8203	E-assessment of Vocational Education	**2**	2			2			
4	EKO 8304	Electrical Learning Project of Vocational Education and Training	**3**	2	1			3		
5	EKO 8205	Internet of Things	**2**	2		2				**26**
6	EKO 8206	Optimization Techniques	**2**	2		2				
7	EKO 8207	Artificial Intelligence	**2**	2			2			
8	EKO 8208	Thesis Proposal	**3**	2	1		3			
9	EKO 8309	Academic Writing	**2**	2				2		
10	EKO 8616	Thesis	**6**		6				6	
		Number of Credit	**26**	**18**	**8**	**8**	**7**	**5**	**6**	
III. SPECIALIZATION SUBJECTS [ELECTIVE]										
	1. Electrical Power Engineering									
11	EKO 8210	Electrical Power System	**2**	2			2			
12	EKO 8211	Electrical Power System Automation	**2**	2			2			
13	EKO 8312	Renewable Energy	**3**	2	1			3		
	2. Industrial Automation Engineering									**7**
14	EKO 8213	Human Machine Interface	**2**	2			2			
15	EKO 8214	Machine Learning	**2**	2			2			
16	EKO 8315	Industrial robotics	**3**	2	1			3		
		Number of Credit	**6**	**4**	**2**		**4**	**2**		
NUMBER OF CREDIT SYSTEM TO BE TAKEN			**40**	**31**	**9**	**13**	**13**	**8**	**6**	**40**

According to the Curriculum the following **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree program Electronics and Informatics Engineering Education:

EACH GRADUATE OF THE MASTER'S STUDY PROGRAM OF ELECTRONIC AND INFORMATICS ENGINEERING EDUCATION HAS ACHIEVED AT LEAST THE FOLLOWING LEARNING OUTCOMES:
1. ATTITUDES:
a. Being devoted to God Almighty and able to show a religious attitude; b. Upholding human values in carrying out duties based on religion, morals, and ethics; c. Contributing to improving the quality of life in society, nation, state, and advancement of civilization based on *Pancasila*; d. Playing roles as citizens who are proud and love the country, have nationalism and responsibility to the state and nation; e. Respecting the diversity of cultures, views, religions and beliefs, and the opinions or original findings of others; f. Working together and having social sensitivity and care for the community and the environment; g. Obeying law and discipline in social and state life; h. Internalizing values, norms, and academic ethics; i. Demonstrating responsible attitudes for work in their expertise independently; j. Internalizing the spirit of independence, struggle, and entrepreneurship.
2. KNOWLEDGE:
a. Being able to demonstrate mastery of electronic and informatics theories and concepts, and develop knowledge and technology in the scientific field or professional practice of electronic and informatics engineering education through research to produce innovative and tested work; b. Being able to solve problems of science and technology in the scientific field of electronic and informatics engineering education through an inter or multidisciplinary approach; c. Being able to conduct research and manage development, which is beneficial to society and science, and to obtain national and international recognition
3. SPECIFIC SKILLS:
a. Being able to develop science and technology in the field of electronic and informatics engineering education based on the values of excellent characters and noble values of religion and nation;

b. Developing self as an independent scientific developer in the field of electronic and informatics engineering and being capable of transferring knowledge and technology in the field of electronic and informatics engineering;
c. Mastering and applying theories and methodology of electronic and informatics engineering education;
d. Mastering, applying, and developing electronic and informatics engineering education through scientific research and studies;
e. Being able to solve problems in electronic and informatics engineering education comprehensively through the development and application of concepts, theories, methodologies, and evaluations/assessments of basic teaching and learning, both individually and in groups;
f. Analyzing and finding new policies that are appropriate for electronic and informatics engineering education;
g. Designing, leading, and managing electronic and informatics engineering education programs and activities;
h. Establishing collegiality and scientific cooperation in electronic and informatics engineering education with both government and private sectors;
i. Disseminating various research results of electronic and informatics engineering education for the benefit of the ummah;
j. Performing a responsive, open, and critical attitude that supports the progress and application of science and technology, especially those relevant to electronic and informatics engineering education.

4. GENERAL SKILL:

a. Being able to develop logical, critical, systematic, and creative thinking through scientific research, design creations or works of art in the field of science and technology that pay attention to and apply humanity values in accordance with their areas of expertise, develop scientific conceptions and study results based on the rules, procedures, and scientific ethics in the form of a thesis or others equivalent, uploaded on the college website, as well as papers that have been published or accepted in accredited scientific journals;
b. Being able to carry out academic validation or studies according to their expertise in solving problems in the relevant community or industry through the development of knowledge and expertise;
c. Being able to generate ideas, thoughts, and scientific arguments responsibly based on academic ethics, and communicate them through the media to the academic community and public;
d. Being able to identify the scientific field that becomes an object of the research and position it on a research map developed through an interdisciplinary or multidisciplinary approach;
e. Being able to make decisions in the context of solving problems in the development of science and technology that pay attention to and apply humanity

values based on the analytical or experimental studies of information and data;

f. Being able to manage, develop, and maintain networks with colleagues and peers in the wider research institute and community;
g. Being able to improve learning capacity independently; and
h. Being able to document, store, secure, and recover research data in order to assure the validity and avoid plagiarism;
i. Being able to publish academic works in accredited national scientific journals or reputable international journals;
j. Being able to adapt, cooperate, create, contribute, and innovate in applying science to social life, and play a role as a global citizen with a global perspective;
k. Being able to uphold academic integrity in general and avoid plagiarism;
l. Being able to use information technology in the context of scientific development and implementation of expertise; and
m. Being able to use at least one international language for spoken and written communication.

The following **curriculum** is presented:

NO	CODE	COURSE	SEMESTER AND CREDITS				NUMBER OF CREDITS
			1	2	3	4	
I.	**BASIC SCIENCE COURSE**						
1	PAS8201	Philosophy of Science	2				7
2	PAS8202	Statistics		2			
3	PAS8303	Educational Research Methodology	3				
	Number of Credits		7	2	0	0	
II.	**SKILL COURSE OF STUDY PROGRAM**						
1	PTI8201	Vocational Education and Training	2				23
2	PTI8202	Technology Enhanced Learning (TEL)	2				
3	PTI8203	Vocational Learning Methodology		2			
4	PTI8204	Evaluation of Vocational Education and Training		2			
5	PTI8205	Information System Management	2				
6	PTI8206	Artificial intelligence		2			
7	PTI8307	Thesis Proposal and Seminar		3			
8	PTI8208	Writing Scientific Papers			2		
9	PTI8609	Thesis				6	
	Number of Credits		6	9	2	6	
III.	**CONCENTRATION COURSE**						
	The concentration of Electronic Engineering Education						6
1	PTI8210	Intelligent Control System	2				
2	PTI8211	Multidimensional Signal Processing Techniques		2			
3	PTI8212	Electronic System Design			2		
	Number of Credits		2	2	2	0	
	The concentration of Informatics Engineering						6
1	PTI8213	Computer Network Management	2				
2	PTI8214	User Experience Design		2			
3	PTI8215	Software Project Management			2		
	Number of Credits		2	2	2	0	
IV.	**ELECTIVE COURSE*** (students are allowed to select four credits from the courses offered)						
1	PTI8216	Internet of Things		2			4
2	PTI8217	Robotics		2			
3	PTI8218	Cellular Technology		2			
4	PTI8219	Medical Electronics		2			
5	PTI8220	Multimedia System		2			
6	PTI8221	Big Data		2			
7	PTI8222	Web-Based Application		2			
8	PTI8223	Data Mining		2			
	Number of Credits		0	4	—	0	
V.	**ADDITIONAL SKILL COURSE** ** (Cross-study courses that can be taken according to additional abilities)						
1.							
2.							
	Number of Credits						
	NUMBER OF CREDITS TAKEN		**15**	**15**	**4**	**6**	**40**

According to the Curriculum the following **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree program Mechanical Engineering Education:

1. Attitude

a. Devotion to God Almighty and able to show a religious attitude;

b. Uphold the value of humanity in carrying out duties based on religion, morals, and ethics;

c. Contribute to the improvement of the quality of community, nation, state and civilization development based on Pancasila;

d. Acting as a proud and loving citizen of the country, having nationalism and a sense of responsibility to the country and nation;

e. Respecting cultural diversity, views, religion and beliefs, as well as other people's original opinions or findings;

f. Cooperate and have social sensitivity and care for the community and the environment;

g. Obey the law and discipline in community and state life;

h. Internalize academic values, norms and ethics;

i. Demonstrate an attitude of responsibility for work in their area of expertise independently;

j. Internalize the spirit of independence, struggle, and entrepreneurship.

2. Knowledge

a. Mastering pedagogical theory and application theory in: planning, implementing, and evaluating vocational learning in mechanical engineering;

b. Mastering the latest theoretical principles and issue learning models in the field of vocational engineering;

c. Mastering theoretical concepts and application theories in the vocational fields of mechanical engineering which include: machining techniques, metal fabrication techniques, design techniques and manufacturing drawings, and welding techniques, as well as being able to formulate procedural problem solving in accordance with those vocational fields.

3. Special Skills

a. Apply general mechanical engineering and theoretical concepts to concentrations: machining techniques, metal fabrication techniques,

manufacturing design and drawing techniques, industrial machinery maintenance, and in-depth welding techniques

b. Apply the field of vocational education in mechanical engineering and utilize science, technology, and / or art in the field of mechanical engineering education in problem solving and be able to adapt to practical learning situations and theories in vocational higher education, S1 mechanical engineering education, and vocational high school (SMK) or vocational education and training institutions;

c. Demonstrate performance in the praxis of mechanical engineering education that can be accountable to service users, stakeholders, and the community by applying basic principles, empowerment in the practice of mechanical engineering education;

d. Utilize relevant science and technology within the scope of mechanical engineering education to recognize students, design, manage, facilitate, evaluate eligibility and supervision as well as continuing coaching in the implementation of mechanical engineering education and training;

e. Formulate the resolution of procedural problems in the learning and manufacturing process of products or formulate new ideas in accordance with the field of mechanical engineering expertise.

4. General Skills

a. Able to develop logical, critical, systematic, and creative thinking through scientific research, the creation of designs or works of art in the fields of science and technology that pay attention to and apply the value of humanities in accordance with their fields of expertise, compile scientific conceptions and results of studies based on rules, procedures, and scientific ethics in the form of a thesis or other equivalent form, and uploaded on the university website, as well as papers that have been published in accredited scientific journals or accepted in international journals;

b. Able to carry out academic validation or study according to their area of expertise in solving problems in the relevant society or industry through developing their knowledge and expertise;

c. Able to arrange ideas, results of thought, and scientific arguments responsibly and based on academic ethics, and communicate them through the media to the academic community and the wider community;

d. Able to identify scientific fields that are the object of research and position them into a research map developed through an interdisciplinary or multidisciplinary approach;

e. Able to make decisions in the context of solving problems in the development of science and technology that pay attention to and apply humanities based on analytical or experimental studies of information and data;

f. Able to manage, develop and maintain a network of colleagues, colleagues within a wider research institution and community;

g. Able to increase the learning capacity independently; and

h. Able to document, store, secure, and rediscover research data in order to ensure validity and prevent plagiarism;

i. Able to publish academic work in accredited national scientific journals or reputable international journals;

j. Able to adapt, work together, create, contribute, and innovate in applying science to social life and acting as a global citizen with global vision;

k. Able to uphold academic integrity in general and prevent the practice of plagiarism;

l. Able to use information technology in the context of scientific development and implementation of the field of expertise; and

m. Able to use at least one international language for oral and written communication.

The following **curriculum** is presented:

No	*Kode* **Code**	*Mata Kuliah* **Course**	*SKS* **Credit**			*Semester* **semester**				**Total Credit**
			Jml	**T**	**P**	**1**	**2**	**3**	**4**	
I. Science Foundation courses										
1.	PPS 8201	*Filsafat Ilmu* **Phylosophy of Science**	2	2	0	2				**7**
2.	PPS 8202	*Statistika* **Statistics**	2	2	0		2			
3.	PPS 8303	*Metodologi Penelitian* **Research Methodology**	3	3	0	3				
II. Study program expertise courses										
1.	MES 8201	*Managemen Pendidikan dan Pelatihan Vokasional* **Vocational Education and Training Management**	2	2	0	2				**29**
2.	MES 8202	*Pengembangan Kurikulum Pendidikan Vokasional* **Development of Vocational Education Curriculum**	2	2	0		2			
3.	MES 8203	*Model Pembelajaran Vokasional* **Vocational Learning Model**	2	2	0		2			
4.	MES 8204	*Evaluasi Pembelajaran Vokasional* **Evaluation of Vocational Learning**	2	2	0		2			

No	*Kode* **Code**	*Mata Kuliah* **Course**	*SKS* **Credit**			*Semester* **semester**				**Total Credit**
			Jml	**T**	**P**	**1**	**2**	**3**	**4**	
5.	MES 8205	*Teknologi Pengelasan dan Fabrikasi Logam* **Metal Welding and Fabrication Technology**	2	1	1		2			
6.	MES 8206	*Teknologi Pemesinan Konvensional* **Conventional Machining Technology**	2	1	1	2				
7.	MES 8207	**Computer Aided Design and Drafting (CADD)**	2	1	1		2			
8.	MES 8208	*Teknologi Pemesinan CNC dan CAM* **Technology CNC Machining and CAM**	2	1	1	2				
9.	MES 8209	*Otomasi Produksi* **Production Automation**	2	2	0	2				
10.	MES 8316	*Proposal Tesis* **Thesis proposal**	3	2	1			3		
11.	MES 8217	*Penulisan Karya Ilmiah* **Scientific Writing**	2	2				2		
12.	MES 8618	*Tesis* **Thesis**	6		6				6	
III. Elective courses *)										
1.	MES 8210	*Kesehatan dan Keselamatan Kerja* **Occupational Health and Safety**	2	2	0		2			**4**
2.	MES 8211	*Metrologi Industri dan Kontrol Kualitas*	2	2	0		2			

No	*Kode* **Code**	*Mata Kuliah* **Course**	*SKS* **Credit**			*Semester* **semester**				**Total Credit**
			Jml	**T**	**P**	**1**	**2**	**3**	**4**	
		Industrial Metrology and Quality Control								
3.	MES 8212	*Mekanika Bahan* **Mechanics of Materials**	2	2	0	2				
4.	MES 8213	*Perawatan dan Perbaikan Mesin* **Machine Maintenance and Repair**	2	2	0		2			
5.	MES 8214	*Sistem Produksi* **Production System**	2	2	0		2			
6.	MES 8215	*Metode Analisis Teknik* **Technical Analysis Method**	2	2	0		2			
	Total credits					**15**	**22**	**5**	**6**	**40**
IV. Additional skills proficiency courses **)										
V. Matriculation courses*)**										
1	MDK 6201	*Ilmu Pendidikan* **Educational Science**	2			2				
2	MDK 6202	*Psikologi Pendidikan* **Educational Psychology**	2			2				
Matriculation courses credits			**4**			**4**				

Note:

*) Elective courses taken at least 4 credits

**) Taking courses in other study programs with credits from 0 to 4 credits (not required)

***) Matriculation courses must be taken by students from non-education, course codes adjust to S1 study programs organized with independent study or attend classes on a separate schedule.