



ASIIN Seal

Accreditation Report

Bachelor's Degree Program
Agricultural Engineering

Master's Degree Program
Agricultural Engineering

Doctoral Program
Agricultural Engineering

Provided by
Universitas Gadjah Mada – Indonesia

Version: 27 June 2025

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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 Committee (TC) ²
Sarjana Teknik Pertanian	Bachelor in Agricultural Engineering	ASIIN	BAN-PT ³ Rank: Excellent (Unggul) (2024 - 2029)	08, 01
Magister Teknik Pertanian	Master in Agricultural Engineering	ASIIN	BAN-PT Rank: A (2020 – 2025)	08, 01
Doktor Ilmu Teknik Pertanian	Doctor in Agricultural Engineering Science	ASIIN	BAN-PT Rank: A (2021 – 2026)	08, 01
Date of the contract: 17.10.2023 Submission of the final version of the self-assessment report: 13.01.2025 Date of the on-site visit: 04.– 05.03.2025 At: Universitas Gadjah Mada Location: Yogyakarta, Indonesia.				
Expert panel: Prof. Dr. Dieter Trautz, Osnabrück University of Applied Sciences Prof. Dr. Chusnul Arif, IPB University Dr.-Ing. habil. Oliver K. Schlüter, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB) Miss Jasmine Tasmara, Master Agricultural and Biosystem Engineering student, IPB University				

¹ ASIIN Seal for degree programs

² TC: Technical Committee for the following subject areas: TC 08 – Agriculture, Forestry and Food Sciences and TC 01 – Mechanical Engineering/Process Engineering.

³ Indonesian National Accreditation Body for Higher Education

Representative of the ASIIN headquarter: Emeline Jerez, PhD	
Responsible decision-making committee: Accreditation Commission for Degree Programs	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2023 Subject-Specific Criteria of Technical Committee 08 – Agriculture, Forestry and Food Sciences as of 27.03.2015 Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering as of 16.03.2021	

B Characteristics of the Degree Programs

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF ⁴	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor in Agricultural Engineering	Sarjana Teknologi Pertanian / Bachelor in Agricultural Technology	1,2,3,4	6	Full time	no	8 Semester	144-148 CSU / 311.68-315.52 ECTS	Once a year (August)
Master in Agricultural Engineering	Master of Science (M.Sc.)	1,2,3,4	7	Full time	no	2-6 Semester	Regular 40-50 CSU / 84.48-103.68 ECTS By research 36-40 CSU 90.24-94.08 ECTS	Twice a year (February & August)
Doctor in Agricultural Engineering Science	Doktor (Dr.) / Doctor	1,2,3,4	8	Full time	no	6–10 Semester 5-10 Semesters	Regular 46 -50 CSU / 110.08-117.75 ECTS By research 44-46 CSU / 108.80-112.64 ECTS	Twice a year (February and August)

1=Biosystem Machinery Engineering; 2= Land and Water Resources Engineering;3= Food, Postharvest, and Bioprocess Engineering; 4=Biological Environment Control Engineering

⁴ EQF = The European Qualifications Framework for lifelong learning

The experts acknowledged and considered the contextual framework within which the Bachelor's, Master's and Doctoral study programs currently being assessed are offered:

Universitas Gadjah Mada (UGM) is a public research university and one of the leading institutions in Indonesia. Established in 1949, UGM is located in the Special Region of Yogyakarta, and its primary campus is Bulaksumur Yogyakarta.

With 18 Faculties, one Postgraduate School (S-2 and S-3), and one Vocational School, UGM consists of several departments and study programs. Its offering ranges from vocational and undergraduate to postgraduate programs, including specialist, professional, master's, and doctoral programs.

As per its vision statement, the university aims "to be an excellent and innovative world-class university, imbued with nation's cultural values based on Pancasila as the state ideology and dedicated to the nation's interest and humanity."

In the 2025 QS World Universities Ranking, UGM is ranked 2nd in Indonesia and 238th in the world.

The Faculty of Agricultural Technology

Fakultas Teknologi Pertanian (FTP) origins can be traced back to the Faculty of Agriculture and Forestry. In the 1960s, this faculty began a process of division, which resulted in the creation of three separate faculties. Currently, FTP comprises the Department of Food and Agricultural Product Technology, the Department of Agricultural and Biosystem Engineering and the Department of Agroindustrial Technology.

The faculty's vision is "to be a center of excellence in implementing Three Pillars of Higher Education in Agroindustry". In realising this vision, the Faculty of Agricultural Technology' mission is:

1. "To conduct internationally reputable higher education in agroindustry to produce highly competent graduates with excellent characters based on Pancasila values.
2. To promote research and innovation in agroindustry for science and technology advancement that is useful for community welfare, locally, nationally and globally.
3. To implement sustainable community services in agroindustry based on the application of innovative science and technology and agro-technopreneurship.
4. To conduct efficient, effective, accountable and professional good faculty governance in higher education."

The Faculty of Agricultural Technology pursues ASIIN accreditation for the three programs at the Department of Agricultural and Biosystem Engineering's, including the Bachelor in Agricultural Engineering (SP-BAE), Master in Agricultural Engineering (SP-MAE) and Doctor in Agricultural Engineering (SP-DAES). The programs are introduced with the following profile in the Self-Assessment Report:

i. Bachelor in Agricultural Engineering

Vision

"To become an internationally reputable study program that is a reference in the field of agricultural engineering and biosystems to support sustainable agro-industrial development".

Mission

"To organize undergraduate education programs that integrate engineering principles with biological, agricultural, and environmental sciences in line with the latest technological developments to support sustainable agro-industrial development".

ii. Master in Agricultural Engineering

Vision

"To become a superior study program in the development of science and technology in the field of agricultural engineering and biosystems to support the development of sustainable tropical industrial agriculture".

Mission

"To organize a master's program in the development of science and technology in the fields of engineering and biosystems to support the development of sustainable tropical industrial agriculture".

iii. Doctor in Agricultural Engineering

Vision

"Become a doctoral study program that becomes a reference in the development of science and engineering in the field of agricultural and biosystem engineering with a focus on precision agriculture towards a sustainable tropical agro-industry".

Mission

"To organize doctoral education programs that facilitate students to conduct scientific studies and research, as well as prepare themselves for professional work in the fields of agricultural and biosystem engineering".

C Expert Report for the ASIIN Seal

1. The Degree Program: Concept, Content & Implementation

Criterion 1.1 Objectives and Learning Outcomes of a Degree Program (Intended Qualifications Profile)

Evidence:

- Self-Assessment Report
- Objectives-Module-Matrices as part of the Self-Assessment Report
- President of the Republic of Indonesia's regulation No. 8 of 2012 on the Indonesian National Qualification Framework
- Ba Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Ma Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Dr Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Curriculum documents, all programs under review
- Tracer Study Report 2024, all programs under review
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The experts base their assessment of the objectives and learning outcomes on the information provided on the websites and in the Self-Assessment Report of the three study programs under review.

UGM presents Program Objectives (POs) and Program Learning Outcomes (PLOs), which are designed around internal and external inputs and benchmarking against relevant national and international standards and references. While the POs are rather general and refer to the vision and mission of the university and Faculty of Agricultural Technology, the PLOs cover a number of specific competences students should acquire in their respective degree programs (see [Appendix](#)).

The PLOs align with the requirements set by the Indonesian National Qualification Framework (*Kerangka Kualifikasi Nasional Indonesia, KNNI*) and the National Standards for Higher Education (*Standar Nasional Pendidikan Tinggi, SN-DIKTI*).

During the audit, the experts sought clarification from the program coordinators about the extent to which inputs from professional associations were considered in the development of POs and PLOs. The program coordinators explained that, according to the Ministry of Education regulation for developing study programs, graduate competencies, and learning objectives, there are several factors they must take into account. These include the labour market, particularly the industry, and professional associations such as the Association of Agricultural Engineering. Additionally, there is now a national forum for study programs related to agricultural engineering. When formulating learning objectives, they adhere to common standards and follow a core curriculum, with 40% of the content reflecting institutional characteristics. Based on national agreements, standards are developed for Bachelor's, Master's, and Doctoral degrees. The experts appreciated that this crucial input is being taken into account.

POs and PLOs can be accessed through various mediums, including the Academic Guidelines and the study program websites. The university also presents tabular mappings of linkages between PLOs and ASIIN's subject-specific criteria within the provided documentation.

The Bachelor in Agricultural Engineering focuses on producing graduates with technical expertise who can apply engineering principles to design innovative products and technologies within agriculture, the environment, and automation. They should be able to think critically and creatively to confront future challenges and seize opportunities in Agricultural and Biosystems Engineering. Additionally, they are equipped to manage and utilize natural resources in an optimal and sustainable manner. Graduates are expected to demonstrate professionalism and leadership, possess data and technology literacy, and effective oral and written communication skills. Furthermore, they should be able to meet the qualifications for continuing their education in postgraduate programs or advancing in engineering. These graduates can become entrepreneurs or key players in the agro-industry sector.

The Master in Agricultural Engineering aims to produce graduates with advanced scientific knowledge in the fields of agricultural and biosystems engineering. Graduates should be capable of designing and conducting research, effectively analysing data, and disseminating their findings. They also should be able to make decisions based on a solid scientific foundation and deliver valuable insights that contribute to the development of their institutions. Graduates are anticipated to develop entrepreneurial activities related to agricultural and biosystems engineering. The master's program graduates are qualified for careers as educators, researchers, system analysts, bureaucrats, consultants, and entrepreneurs

The Doctoral program in Agricultural Engineering expects its graduates to develop new science or technology in the field of agricultural engineering and biosystems. They are expected to produce research through inter-, multi-, and transdisciplinary approaches and generate original, new, and leading scientific works in the field of agricultural and biosystem engineering. Graduates should be able to provide consultation and recommendations in decision-making and problem-solving in the field of agricultural engineering and biosystems. Graduates of the doctoral program are prepared for careers as lecturers, researchers, consultants, bureaucrats, or entrepreneurs.

During the audit, the experts focused on the graduate profiles of the master's and doctoral programs, noting the expectation for graduates to become entrepreneurs. However, they observed that there are no specific courses dedicated to entrepreneurship within the curriculum. The program coordinators confirmed this, explaining that while there are no dedicated entrepreneurship courses, the faculty occasionally invites industry professionals to give talks on the topic. A training program is also available for students who wish to enhance their entrepreneurial skills. Based on these discussions, it is clear that entrepreneurship skills development is largely left to the students themselves. An important recommendation for the faculty is to establish a clear, structured approach that actively supports the development of entrepreneurial skills among these students.

Apart from this, during the discussion with the assessment team, students and alumni expressed their satisfaction with the programs under review, the learning experience, and future job prospects.

The experts appreciate that UGM aims for high standards to give their graduates good chances in the national job market as well as a good starting point to transfer to other academic programs to complete a Master's or a PhD program. They see evidence that the intended qualification profiles of the three study programs under review allow students to take up an occupation that corresponds to their qualifications.

When asked about the acceptance of graduates in the labour market, the program coordinators explained that they conduct tracer studies to monitor this. These studies have shown, for example, that most Bachelor's program graduates secure employment in less than six months.

Graduate labour market acceptance was confirmed during the discussions with the industry partners as they expressed their willingness to take student interns and graduates. They noted the graduates' positive attitude, open-mindedness, and eagerness to learn. Faculty of Agricultural Technology graduates are also quick to adapt and are well-prepared for the workforce.

Several lines of evidence indicate that students are well prepared for entering the job market, and employers are satisfied with the knowledge and technical skills of the graduates. The expert panel is particularly impressed by the Faculty of Agricultural Technology's establishment of a collaborative network with industry and government agencies by providing them with professionals.

In summary, the experts hold the view that the objectives and intended learning outcomes of all three study programs under review are reasonable and well-founded. The degree programs are designed in such a way that they meet the goals set for them. The experts conclude that the degree programs' objectives and intended learning outcomes adequately reflect the intended level of academic qualification - EQF 6 for the Bachelor's program, EQF 7 for the Master's program, and EQF 8 for the Doctoral program.

Criterion 1.2 Name of the Degree Program

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the experts:

According to the Self-Assessment Report, the nomenclature for the degrees awarded adheres to the regulations established by the Minister of Research, Technology and Higher Education.

Graduates of the Bachelor in Agricultural Engineering are awarded the title Sarjana Teknologi Pertanian (S.TP.) or Bachelor of Agricultural Technology. Those completing the Master in Agricultural Engineering receive the title Master of Science (M.Sc.). Graduates of the Doctoral program in Agricultural Engineering Science receive the title Doktor (Dr.) or Doctor.

In evaluating whether the names of the degree programs accurately reflect the focus and content of the respective programs, the experts particularly examined the Bachelor's and Master's programs in Agricultural Engineering. From their perspective, these programs clearly fall within the field of engineering, with the POs, PLOs, and curricula strongly oriented toward engineering principles.

During the audit, the experts asked the program coordinators why the degrees awarded do not reflect this engineering focus, such as Bachelor of Engineering (ST) or Master of Engineering (MT). The program coordinators clarified that, in their view, the degree title reflects the scope of each study program, as it is not purely focused on engineering. For the Bachelor's program, for example, the decision was to award the degree of Bachelor of

Agricultural Technology because this better aligns with the interdisciplinary nature of the program, which combines both technology and engineering.

However, feedback from stakeholders suggested that the degree awarded should more accurately reflect the program's profile. In light of this, the experts recommend that the university consider awarding the degrees as Bachelor/Master of "Agricultural Engineering" rather than Bachelor of Agricultural Technology/Master of Science, in order to better align with the program's objectives, learning outcomes, and curriculum.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Academic Handbook
- Module descriptions
- Ba Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Ma Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Dr Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The curricula, structure, and composition of the study programs under review are presented in the Academic Handbook and program websites.

Structure and contents

Each semester is equivalent to 16 weeks, including 14 weeks of learning activities and 2 weeks for midterm and final exams. The odd semester starts in August, and the even semester starts in January.

Bachelor in Agricultural Engineering

The bachelor's curriculum is aligned with the national standards in Indonesia and is designed for eight semesters. It encompasses a minimum of 144 CSU (311.68 ECTS points), divided into compulsory and elective courses.

In the initial stages of the program, students are introduced to generic courses (see curricular overview in the [Appendix](#)). Among these are courses in mathematics and natural sciences, introductory courses in agronomy and agricultural technology, Religion,

Citizenship Education and the Ideology of the Republic of Indonesia, English, Bahasa Indonesia, engineering fundamentals, and more. These courses provide students with an understanding of socio-cultural aspects and foundational principles relevant to their discipline.

As students advance through the program, the courses become more focused and specific, allowing them to delve deeper into the field. Practical laboratory work is incorporated into the curricula, enabling students to gain hands-on experience.

In the later stages of the program, the curriculum becomes more specialized, with students narrowing their focus to advanced areas. By the 4th semester, bachelor's students concentrate on their interest area:

1. Biosystems Machinery Engineering,
2. Land and Water Resources Engineering,
3. Food, Postharvest, and Bioprocess Engineering, and
4. Biological Environment Control Engineering.

Students take specialized subjects and engage in professional development activities. They also complete community service and write a thesis in the final year.

The curriculum incorporates the Independent Learning–Independent Campus program (Merdeka Belajar – Kampus Merdeka, MBKM), a government-led initiative regulated by the Minister of Education and Culture Regulation No. 3/2020. This initiative encourages students to participate in activities outside their study program.

Students have two graduation route options: the Regular route for those who do not participate in the MBKM program and the Merdeka Belajar pathway for those who do. Students choosing the Independent Learning route can complete their courses by taking classes in other study programs within or outside UGM or by participating in one of the nine MBKM activities. These activities include: 1) Student Exchange, 2) Internship, 3) Teaching, 4) Humanitarian Project, 5) Independent Study, 6) Research, 7) Entrepreneurship, 8) Community Development, and 9) State Defense Program.

Master in Agricultural Engineering

The Master's program offers two tracks, Regular and By-Research, and it is designed to be completed in four semesters.

The Regular track encompasses a minimum of 40 CSU (84.48 ECTS). As outlined in the curricular overview below, during the first two semesters, students are provided with a foundational understanding of related agricultural engineering knowledge through

compulsory and elective courses. The students are expected to embark on their research in the third semester.

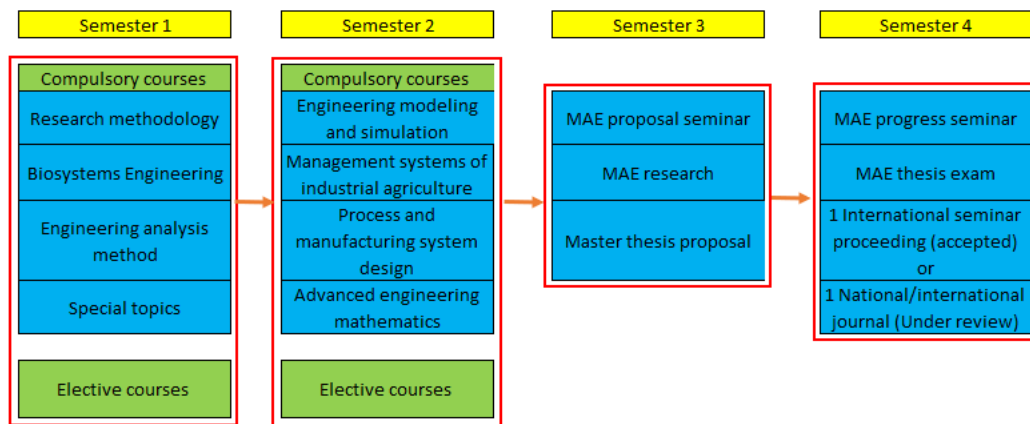


Figure 1: Curricular Overview for Master in Agricultural Engineering "Regular" Program
Source: Self-assessment report, UGM.

The By Research track comprises a minimum of 36 CSU (90.24 ECTS). It involves compulsory courses up to 100 % of the total credits, with modules such as Research Methodology, Biosystem Engineering, Engineering Analysis Methods and Thesis. The students focus on their research from the first semester.

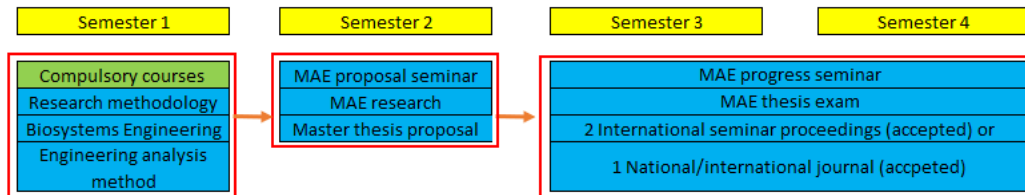


Figure 2: Curricular Overview for Master in Agricultural Engineering "By Research" Program
Source: Self-assessment report, UGM.

Since 2024, the Master's program has offered a Fast Track option for SP-BAE students who have completed at least six semesters, earned 28.16-32.00 ECTS, and have a cumulative GPA of 3.25. These students enter the Master's Regular Program in semester 7, taking compulsory and elective courses for two semesters while also working on their Bachelor's thesis. In semesters 9-10, students focus on their Master's research. The final exam requirements are the same as those for the Master's Regular Program.

Doctoral program in Agricultural Engineering Science

The Doctoral program also offers two tracks, Regular and By-Research, and it is designed to be completed in six semesters. Based on academic regulations, the maximum length of study is 7 years or 14 semesters.

The Regular program requires a minimum of 46 CSU (110.08 ECTS), while the By-Research program consists of 44 CSU (108.80 ECTS). Compulsory and elective courses for both the Regular and By-research programs are completed in the first semester. After completing the courses in the first semester, doctoral students engage in writing dissertation proposals, conducting proposal examinations, conducting dissertation research, presenting research progress and results, writing publications, composing dissertations, and preparing for the final report examination.

For the Regular program, the credits for courses are slightly higher. However, the credit assigned to the regular dissertation in the Regular program is lower than that of the By-Research program due to the number of publications required. Before graduation, the minimum number of publications required is two for the Regular program and three for the By-Research program.

Since 2024, DAES has also offered a Fast-Track program funded through the Master's to Doctoral Education Scholarship for Outstanding Graduates. This scholarship is available for outstanding fresh Bachelor's degree graduates who want to pursue a Master's to Doctoral program in 4 years.

International Mobility

UGM provides opportunities for students to conduct stays abroad and to join exchange programs. The UGM's International Office is responsible for managing and coordinating international activities such as organizing student mobility programs, developing and maintaining relationships with partner institutions and organizations around the world, recruiting and admitting international students, providing support and assistance to international students during their time at UGM, such as helping with housing, visa issues, and other practical matters.

Students' international academic mobility is supported by the Indonesian Government. For example, through the Indonesian International Students Mobility Awards (IISMA), a scholarship program from the Ministry of Education, Culture, Research and Technology starting in 2021. In addition, lecturers are encouraged to conduct joint research with international partners and involve students in their projects.

As mentioned earlier, the Indonesian government supports activities outside the university through the MBKM program. UGM recognizes these activities based on the comparability of the intended learning outcomes. The experts deem this regulation sufficient.

According to the Self-Assessment Report, the Bachelor in Agricultural Engineering program has organized summer school and exchange student programs in collaboration with universities in Japan, Malaysia, and Thailand. Since 2019, 11 students have visited

universities, laboratories, and research centers in Malaysia, while one student participated in a program in Japan.

The same opportunities are available for the Master's program students, as they can also participate in exchange student programs organized in collaboration with universities in Japan, Malaysia, and Thailand. Since 2019, 11 students have visited universities, laboratories, and research centers in Malaysia, and two students have participated in programs in Japan.

Doctoral program students are also encouraged to participate in academic mobility, including seminars and other activities. They can join exchange student programs through partnerships with universities in Japan or take part in research abroad with scholarships from the Indonesian government's PMDSU program. The study program supports student mobility through an internal budget for international seminars and mobility, with additional financial support from lecturers' projects. Between 2023 and 2024, four students have taken part in seminars in Thailand, Malaysia and Austria.

The students confirmed during the discussion with the experts that opportunities for international academic mobility exist. For example, Bachelor's students mentioned the opportunity to attend competitions in Indonesia, Thailand, and Malaysia with support from the faculty. A doctoral student discussed attending a research seminar in India focused on sugar cane, while a Master's student shared their experience of studying in Japan, where they received a scholarship for living expenses and financial support for their research. Currently, another Master's student is in Japan working on their thesis and collaborating in a research consortium involving three universities in Japan and Indonesia.

The experts discussed with UGM's management if there is a strategic concept to increase the international mobility of students and teaching staff. They learned that UGM has many international partners, has developed a fellowship program, and provides scholarships for foreign students who want to study at UGM. Moreover, international guest lecturers are invited, and a cooperation agreement with the German Academic Exchange Service (DAAD) and a similar Dutch organisation exists for senior professors who are invited to teach for some time at UGM. Finally, summer courses are conducted with international participants and double degree and exchange programs are established with different institutions abroad.

The experts recognize that UGM has already initiated national and international collaboration with different institutions to provide international mobility opportunities for students. However, as the number of students who spend time abroad remains relatively low, they recommend increasing the effort to further internationalise UGM by

establishing more international cooperation and exchange programs and offering more and better-endowed scholarships.

Rules for recognizing achievements and competences acquired outside UGM exist, but only very few students attend classes at international universities.

Furthermore, the experts note that in alignment with the programs' aspirations to enhance their presence on the international stage, improving the English language proficiency of students and teaching staff becomes a critical area of development. It is recommended that the university consider increasing the integration of English in the study programs, as a survey conducted during the meeting with students revealed that several expressed a desire for more English content.

Additionally, when asked to evaluate the English skills of their lecturers and supervisors on a scale from 1 to 5, the responses were as follows: 35% rated them a 5, 45% a 4, and 20% a 3. In light of this feedback and to support the internationalization objectives of the three programs under review, the experts recommend that measures be taken to further enhance the English language skills of both students and teaching staff.

In summary, the experts appreciate the effort to foster international mobility and support both the Faculty of Agricultural Technology and UGM to pursue this path.

Curriculum review

The curriculum review of the three study programs is conducted independently, involving internal stakeholders such as faculty leaders, program managers, course lecturers, and external stakeholders. The curriculum review is carried out at least once every five years and as needed. The individual modules are evaluated and revised as necessary each year at the beginning of the new semester to ensure that they are aligned with the PLOs mandated for each course. At the end of the semester, the degree programs also conducts portfolio analysis to measure the achievement of the PLOs of each course.

After analysing the module descriptions and the study plans the experts confirm that the three study programs are divided into modules and that each module is a sum of coherent teaching and learning units. All working practice intervals and internships are well integrated into the curriculum, and the supervision by the Faculty of Agricultural Technology guarantees their respective quality in terms of relevance, content, and structure. The study plans are meticulously crafted to ensure a balance between theoretical knowledge and practical application, preparing graduates for various roles within the agricultural engineering industry.

In addition, the experts gained the impression that the choice of modules and the structure of the curriculum ensures that the intended learning outcomes of the respective degree program can be achieved.

The experts confirm that the graduates of the degree program under review are well prepared for entering the labour market and can find adequate jobs in Indonesia. During the discussion with the experts UGM's partner from the industry/public sector confirmed that the graduates have a broad scientific education, are very adaptable, and have manifold competences, which enables them to secure and excel in suitable employment opportunities.

Criterion 1.4 Admission Requirements

Evidence:

- Self-Assessment Report
- Academic Guidelines UGM's independent exam official website:
<https://um.ugm.ac.id>
- UGM tuition fees: <https://um.ugm.ac.id/uang-kuliah-tunggal-ukt-snbp-dan-snbt-ta-2025-2026/>
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The admission and selection process for prospective students in the undergraduate and graduate programs within the Faculty of Agricultural Technology adheres to UGM's established guidelines for new student admissions. Comprehensive information regarding admission requirements, schedules, registration locations, and selection tests is published online via the independent exam official website, ensuring accessibility for all stakeholders.

Bachelor in Agricultural Engineering

According to the website, there are three different ways by which students can be admitted to a Bachelor's program at UGM:

1. National Entrance Selection of State Universities (*Seleksi Nasional Berdasarkan Prestasi - SNBP*), a national admission system based on the academic performance during the high school (40% of students at UGM are admitted through this pathway).
2. Joint Entrance Selection of State Universities (*Seleksi Nasional Berdasarkan Tes - SNBT*), a national selection test held every year for university candidates. It involves

a nationwide written test in subjects such as mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography (It accounts for 30% of the admitted students at UGM).

3. Independent Entrance Selection: Students are either selected based on a computer based test (similar to SNBT) specifically held by UGM or on merits/social reasons. (30 % of the undergraduate students at UGM are admitted this way).

The annual intake quota of the Bachelor in Agricultural Engineering is 100 students each year. The table below shows the admission data for the past five years. Based on the data, the number of applicants have declined but still exceeds the number of available places. For example, in 2023/24, there were 824 students applying for admission and only 108 candidates were selected. This is equivalent to an admission rate of 13 %.

*Table 1: Applicants, Selected and Registered for SP-BAE in 2019-2024
Source: Appendix to the Self-Assessment Report, UGM.*

SP	Year	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
BAE	Applicants	1404	2018	743	841	824
	Selected	105	115	103	105	108
	Registered	100	103	99	97	97

The experts discussed with the program coordinators the significant decrease in the number of applicants in 2021, which was attributed to changes in the entrance examination methods post Covid-19 pandemic. The experts inquired whether there might be other contributing factors, given the drop was as high as 60%. The program coordinators explained that the decline in applicants is a challenge faced by universities in Indonesia, as the economy has also been affected. However, the faculty continues to make consistent efforts to promote its study programs, including introducing new entry pathways to attract more students. The experts appreciate this explanation and support the measures being taken.

Further details of the application process and further information on admission criteria and deadlines can be found on UGM's homepage and the Academic Guidelines, which are also published on the university's website.

Master in Agricultural Engineering

For admission to the master's program, prospective students can apply via the official website. Together with submitting documentation on academic qualifications, candidates are required to provide a verification of English proficiency (e.g. TOEFL ITP score ≥ 400) and sufficient academic ability (e.g. Academic Potential Test (TPA) score ≥ 450).

The capacity of the master's program is 15 students per semester. The table below illustrates the fluctuations in the number of applications and registered students. Over the

past five years, the number of applications has ranged from 13 to 23, while the number of registered students has varied between 7 and 19. According to the Self-Assessment Report, there was a 30% increase in applicants in 2020, attributed to changes in entrance examination methods during the pandemic and the adoption of online and distance learning. Regarding the selected applicants, many depend on scholarships to finalize their registration. If they receive scholarships, they will enrol; otherwise, they may postpone their registration. Additionally, there has been an increase in international applicants particularly from Pakistan and Africa.

Table 2: Applicants, Selected and Registered for SP-MAE in 2019-2024

Source: Appendix to the Self-Assessment Report, UGM.

SP	Year	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
MAE	Applicants	13	23	21	23	19
	Selected	9	14	20	14	18
	Registered	7	14	19	14	15

Doctoral program in Agricultural Engineering Science

Detailed registration information for the doctoral program is available on the university and program websites. Requirements for SP-DAES registration include a Master's degree GPA (at least ≥ 3.00 for graduates from an A-accredited study program), English proficiency (e.g. TOEFL ITP score ≥ 450) and sufficient academic ability (e.g. Academic Potential Test (TPA) score ≥ 500). Additionally, prospective students must submit a tentative research outline for their dissertation and undergo an interview to assess their commitment to the program. All academic requirements for Indonesian students also apply to international students.

The table below presents the student admission data for the doctoral program. The number of applications increased from 7 in the 2022/2023 academic year to 12 in 2023/2024. As indicated in the Self-Assessment Report, the intake 2023/2024 accounts for one international student from the Philippines. The program has gained international recognition with several inquiries from students from India, Pakistan, and Africa, looking to apply for scholarships such as the Gadjah Mada International Fellowship (GMIF) and Developing Country Partnership Scholarships (KNB).

Table 3: Applicants, Selected and Registered for SP-DAES in 2019-2024

Source: Appendix to the Self-Assessment Report, UGM.

SP	Year	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
MAE	Applicants	11	9	9	7	12
	Selected	7	5	6	7	11
	Registered	7	4	6	3	7

Overall, for the three programs under review, the experts 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

The Bachelor in Agricultural Engineering program's regular tuition fees (150 - 1100 EUR) are within the national range. The tuition fees for undergraduate students depend on the parents' income. The Master's program in Agricultural Engineering (1017.03 EUR) is in the same range as the fees of similar programs at other top Indonesian universities, where fees generally range from 900 to 1200 EUR. The Doctor in Agricultural Engineering Science fee (1083 EUR) is also standard, comparable to the national range of 1080 to 1500 EUR per semester.

Due to the numerous scholarship opportunities offered to UGM, a significant proportion of students, particularly those in the Master's and Doctoral programs, receive them. These scholarships typically cover tuition fees and include additional funds to support living expenses.

Criterion 1.5 Workload and Credits

Evidence:

- Self-Assessment Report
- Module Handbooks
- Study Plans
- Academic Guidelines
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

All degree programs at UGM must follow the Indonesian credit system (CSU) regulations. Each Indonesian credit point is distributed between guided and independent learning activities, as well as between face-to-face activities, laboratory activities/practicum, and project and field practice. According to the National Standards for Higher Education (SNPT), the learning activities are lectures, responses and tutorials, seminars, and practicum.

For regular classes in the study programs, 1 CSU of academic load is equivalent to 3 academic hours, which equals 170 minutes of weekly educational activities. This includes:

- 50 minutes of scheduled contact with the teaching staff in learning activities,

- 60 minutes of structured activities related to lectures, such as doing the assignments, writing papers, or reviewing literature,
- 60 minutes of independent activities outside the classroom to obtain a better understanding of the subject matters and to prepare academic assignments such as reading references.

Since there are 16 weeks in a semester, then 1 CSU is equal to 48 hours of educational activity in one semester.

For laboratory and other psychomotor skills or physical activities, including community services, 1 CSU equals 2 to 3 hours of physical or psychomotor activity, plus one hour of task completion (writing a laboratory report) and one hour for self-study. So, the total is 4 to 5 hours a week or 64 to 80 hours a semester.

All study programs under the Department of Agricultural and Biosystems Engineering follow an ECTS conversion based on UGM's regulation NOMOR 4732/UN1.P.I/Dir-PP/KR.01.02/2023 as follows:

*Table 4: Conversion of CSU to ECTS for SP-BAE, SP-MAE, and SP-DAES
Source: Self-Assessment Report, UGM.*

Activities	Credits (CSU)	ECTS
Courses	1	1.92
Laboratory work	1	2.56
Internship	1	2.56
Research	1	2.56

The details and the students' total workload are described in the respective module description.

Bachelor in Agricultural Engineering

The bachelor's program comprises 126 CSU (277.12 ECTS) of compulsory courses and 18-22 CSU (34.56-38.4 ECTS) of elective courses.

The semester GPA determines the maximum number of credits students can take the following semester, with a maximum of 24 CSU if $GPA \geq 3.00$ according to the Academic Guidelines. Bachelor's students are required to attend their classes in accordance with established regulations. They must be present for at least 75% of the theoretical courses and 100% of the practical courses (absence due to valid reasons is only permitted once per practical session). If a student's attendance falls below these percentages, they are not allowed to attend the final examination.

The maximum time to complete the bachelor's program is 14 semesters.

Master in Agricultural Engineering

The Regular program comprises 32 CSU (69.12 ECTS) of compulsory courses (20 CSU for core courses, 12 CSU for the thesis) and 8-18 CSU (15.36-34.56 ECTS) of elective/concentration courses. The By Research program comprises 36-40 CSU (90.24-94.08 ECTS) of compulsory courses (7 CSU for courses, 30 CSU for the thesis).

Master's students are evaluated at the end of their second semester to determine if they have earned a minimum of 15 credit hours and achieved a Grade Point Average (GPA) of at least 3.00 for the top 15 credit hours. If the student does not meet these requirements, they are granted an additional one-semester extension. If the student fails to make progress after this extension, they will not be allowed to continue their studies and will be considered to have withdrawn or dropped out.

The requirements for graduation and obtaining a master's degree must be fulfilled within a maximum of six semesters.

Doctoral program in Agricultural Engineering Science

The Regular program comprises 39 CSU (96.64 ECTS) of mandatory courses (5 CSU for courses, 34 CSU for dissertation) and 7-11 CSU (13.44-21.12 ECTS) of elective courses. The By Research program comprises 43 CSU (106.88 ECTS) of compulsory courses (5 CSU for courses, 38 CSU for the thesis) and 1-3 CSU (1.92-5.76 ECTS) of elective courses.

Study evaluations for doctoral program students are conducted at the end of each semester. If, at the end of the second semester, it is determined that the coursework for all assigned courses (12 credits) has not been completed with a minimum GPA of 3.25, the student is deemed unable to complete the study and is not permitted to continue.

All requirements for graduation and the Doctoral degree must be fulfilled within a maximum of ten semesters.

For the three study programs under review, the experts point out that there can be no fixed conversion rate between CSU and ECTS points. Therefore, the ECTS points need to be calculated separately for each course. This is necessary because the time students need for self-study varies for each course.

UGM should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations). In other words, a seminar and a lecture may require the same number of contact hours, but one may require a significantly greater workload than the other because of differing amounts of independent preparation by students.

As workload is an estimation of the average time spent by students to achieve the expected learning outcomes, the actual time spent by an individual student may differ from this estimate. Individual students differ: some progress more quickly, while others progress more slowly. Therefore, the workload estimate should be based on the time an “average student” spends on self-study and preparation for classes and exams. The initial estimation should then be verified via students’ satisfaction questionnaires.

Since the workload of the students is an estimation by each study program, the experts expect UGM to verify the students’ total workload and adjust the awarded ECTS points for each course accordingly. This could be done, for example, by including a respective question in the satisfaction questionnaires. In any case, UGM must make sure that the actual workload of the students and the awarded ECTS credits correspond with each other and make that information transparent in the module descriptions and the study plans.

The university provided data on enrolments, dropouts, on-time graduation, and average study duration in its Self-Assessment Report and accompanying appendices for the three programs under review.

During the academic years 2019/2020 to 2023/2024, the Bachelor in Agricultural Engineering program had 496 students registered and experienced no dropouts. The completion time for this program ranged from 4.9 to 4.2 years, slightly exceeding the 4-year standard study duration .

In the same period, the Master in Agricultural Engineering program had 69 students registered, also with no dropouts. The completion time for this program has fluctuated from 2.6 to 2.2 years.

For the Doctoral program in Agricultural Engineering, from the 2019/2020 cohorts, 27 students registered with 0 dropouts. This indicates that most students remain committed to their studies, even though the average completion time extends beyond the standard study period, averaging 5.10 years in the academic year 2022/2023.

During the audit, the experts learned that the publication requirement seems to be a significant barrier to timely completion for Master’s and Doctoral students. The experts believe that measures needs to be implemented to address this challenge and ask the university to enhance its assistance for student progression to promote timely graduation (e.g., mandatory workshops, seminars etc.).

Criterion 1.6 Didactic and Teaching Methodology**Evidence:**

- Self-Assessment Report
- Academic Guidelines
- UGM Learning Management System: <https://simaster.ugm.ac.id/>
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

Once the learning outcomes (LOs) are defined, appropriate teaching and learning methods are chosen to ensure their achievement. The programs under review have transitioned to student-centred learning and use methods that engage students in the learning process, fostering the development of their critical thinking and analytical skills. In addition, blended learning has been introduced as a teaching innovation. The use of e-learning in the learning process allows for class activity without physical attendance. Based on Rector Decree No 463/UN1.P/KPT/HUKOR/2019, the maximum digital teaching mode is 40%.

Through the UGM Integrated Information System SIMASTER, lecturers can share teaching materials, send notifications, and provide specific instructions. Meanwhile, students can submit assignments and exam papers and provide feedback on their learning experience. UGM also offers online tools, such as Zoom, to help lecturers deliver course materials. During the audit visit, the experts learned about ELOK, an e-learning system designed for Massive Open Online Courses (MOOCs). The experts commend UGM for providing this platform, recognizing MOOCs as an excellent tool to share information and facilitate communication with both internal and external stakeholders.

Workshops are offered to support and guide teaching staff in effectively integrating online tools into the learning process.

The Bachelor's program in Agricultural Engineering utilizes various educational methods for each course, including practical laboratory work, field studies, lectures, Community Service, and a Bachelor's thesis.

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. UGM encourages students to gain knowledge from different scientific areas and introduces them to research activities.

In the Master's program, lectures, discussions, problem-based learning, research-based learning, project-based learning, cooperative learning, and tutorials are conducted. Presentations and seminars involve students individually or in groups to actively communicate their ideas by explaining or describing the analysis of case studies, reports,

or other specific topics systematically. This method is also used for disseminating students' research proposals and theses.

There are no laboratory works for Master's students; thus, the teaching methods to support motoric competence are done by peer-teaching or Visual Aids and Demonstrations.

The Doctoral program employs a variety of teaching and didactic methods tailored to the advanced and specialized nature of the education. These methods aim to equip candidates with the knowledge, skills, and competencies necessary for independent research, critical analysis, and academic or professional excellence. This includes individualized mentorship, research seminars and workshops, coursework and advanced classes, and independent research.

In summary, the experts judge the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concepts of all three programs comprise a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

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

The experts thank UGM for the provided statements and additional documentation concerning criterion 1.

(ASIIN 1.1) Entrepreneurship in the graduate profile – Master's and doctoral programs

The university has removed "entrepreneur" from the graduate profiles of its Master's and Doctoral programs to better align with students' actual career paths and ensure consistency between learning outcomes and curriculum design. Although entrepreneurship will no longer appear as a formal graduate outcome, the university remains committed to supporting it through a range of enrichment activities. The experts acknowledge that entrepreneurship may still be included in these supplementary programs, but since the strategy has yet to be defined, they continue to recommend establishing a clear structure to support students in developing entrepreneurial skills.

(ASIIN 1.2) Name of the degree program – Bachelor's and Master's programs

The university justifies its current degree titles both legally and academically. However, the experts contend that these titles do not adequately reflect the "engineering" emphasis of the curriculum, potentially leading to misunderstandings among international

stakeholders. "Agricultural Engineering" suggests that the engineering component is more prominent than the science and technology. While UGM, as a state university with legal entity status (PTN-BH), has the authority to determine academic degrees, it is essential to consider the fundamental scientific discipline represented in the curriculum content. The experts argue that the engineering component indeed dominates over science and technology within the programs. Consequently, they reiterate their recommendation for clarity and alignment in the degree titles to accurately convey the focus of both curricula.

(ASIIN 1.3) International student mobility – All three programs

The university has outlined both its achievements and specific plans to enhance student mobility and international cooperation. While the experts support the planned initiatives, they reiterate their recommendation as an area that requires ongoing support.

(ASIIN 1.3) English language proficiency of students and teaching staff – All three programs

The university has presented planned initiatives to improve students' and teaching staff's English language proficiency. The experts support these efforts, emphasizing that this area requires sustained attention. Additionally, they note the importance of these plans being regularly and continuously monitored and evaluated.

(ASIIN 1.5) Workload and credits – all three programs

The university has noted that transparency is ensured by providing course planning documents (RPKPS) at the beginning of each course. UGM verifies student workload through multiple mechanisms, including internal and external audits, satisfaction surveys, and online teaching evaluations (EDOM). To ensure workloads are manageable and align with the number of enrolled credits, faculties and departments conduct annual surveys on learning activities. Information about workload is also included in module descriptions and study plans, which are available to stakeholders via program websites. The experts take note of this explanation and have no further comments on the matter.

(ASIIN 1.5) Timely completion and graduation – Master's and Doctoral programs

The experts appreciate the university's awareness of scientific publication as a major factor in the completion of the Master's and Doctoral studies. To address this, several measures have been implemented including language editing services, support for international seminars, research funding with publication targets, incentives for accepted or published articles, and a database of suitable journals to target submissions effectively. Additionally, the program plans to hold a "Journal Clinic" at least once per semester to guide students through the publication process. The experts acknowledge that this challenge is common

across many study programs in Indonesia and is not easily resolved. They therefore reiterate the need for these initiatives to be regularly monitored and evaluated, and they look forward to a report on their effectiveness.

Considering the above-mentioned points, the experts regard this criterion mostly fulfilled.

2. Exams: System, Concept and Organisation

Criterion 2 Exams: System, Concept and Organisation

Evidence:

- Self-Assessment Report
- Module handbooks
- Academic Guidelines
- Academic Calendar
- Samples of student's work (projects, exams and thesis)
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

Forms of Examinations and Exam Schedule

According to the Self-Assessment Report, academic assessment is conducted using formative and summative methods through quizzes and exams. Meanwhile, soft skills (non-academic) assessment is integrated into the learning process, including communication skills, teamwork, self-confidence, discipline, and being active in the classroom.

The module handbook specifies the course's intended learning outcomes (CLO) and identifies the types of examinations used to assess their achievement. As seen in the module handbooks, various assessment methods are used in the programs, which can be performed as scheduled (i.e. mid-term and final exams) and flexible assessments in the form of structured tasks.

Table 5: Some exam types (Cognitive Competence)
Source: Self-Assessment Report, UGM.

Program	Exam Format	
SP-BAE	Cognitive	Essay Questions, Problem-Solving Tasks, Project-Based, Performance (presentations, debates, or demonstration), Peer Assessment, Problem-Based Scenarios, Portfolio.
	Motoric	Observational Assessment, Portfolio, Demonstration, Performance-Based, Peer and Self-Assessment.

Program	Exam Format	
	Affective	Observational Assessment, Peer and Self-Feedback, Role-Playing and Simulations, Portfolio, Performance Tasks and Presentations.
SP-MAE	Cognitive	Essay Questions, Problem-Solving Tasks, Project-Based, Performance (presentations, debates, or demonstration), Peer Assessment, Problem-Based Scenarios, Portfolio.
	Motoric	Observational Assessment, Portfolio, Peer and Self-Assessment.
	Affective	Observational Assessment, Peer and Self-Feedback, Role-Playing and Simulations, Portfolio, Performance Tasks and Presentations.
SP-DAES	Cognitive	Essay Questions, Problem-Solving Tasks, Project-Based, Performance (presentations, debates, or demonstration), Problem-Based Scenarios, Portfolio.
	Motoric	Observational Assessment, Performance (presentations, debates, or demonstration), Portfolio, Publications
	Affective	Observational Assessment, Role-Playing and Simulations, Portfolio, Performance Tasks and Presentation, Publications

Information about exam types and schedules is written in the Semester Learning Plan and Learning Contract, which are informed to students in the first session of each course. The form and length of each exam are specified in the course description available to the students via the university's E-learning management system (SIMASTER). Through the latter, lecturers can conduct quizzes and examinations and provide feedback on assessments. The students also learn about mid-semester and end-of-semester exams via the academic calendar.

The experts confirm that the different forms of examination used are competence-oriented and are suitable overall for verifying the achievement of the intended learning outcomes as specified in the respective module descriptions. The form of examination is determined individually for each course and published in the respective module description. The forms of examination are based on the main content of the modules and the level is appropriate for the respective degree program.

Grading and Graduation Requirements

The final grade of each module is a combination of the scores of the individual types of assessment. The final grade of the course is given as a quality letter and quality score as follows:

Table 6: Numerical Value of each Grading Scale
Source: Academic Guidelines, UGM.

Letter Grade	Score	Letter Grade	Score	Letter Grade	Score
A	4.00	B-	2.75	C/D	1.50
A-	3.75	B/C	2.50	D+	1.25
A/B	3.50	C+	2.25	D	1.00
B+	3.25	C	2.00	E	0.00
B	3.00	C-	1.75		

If students fail to fulfil the minimum requirement of the course and obtain an E grade, they have to repeat the related course in the following semester or year. Students can also

retake the course to improve their competency and understanding of the specified subjects. However, the final grade will be based on the latest mark.

Should students face exceptional circumstances, such as emergencies, hospitalisation, or bereavement, which prevents them from sitting for midterms or final exams, they may be eligible to take a follow-up exam. The lecturer or faculty will determine the time for the makeup exam, and students must provide suitable evidence to support their request.

Final grades are available on students' academic accounts (SIMASTER) no later than 2 weeks after the last exams. When students have objections to their exam results, they have the opportunity to appeal directly to the relevant lecturer within one week of the grade announcement. The students confirmed that an appeal mechanism exists if they perceive their grades as unfair.

In order to graduate from the programs under review, students must:

1. Bachelor of Agricultural Engineering: not exceed the maximum study period, have active student status, and fulfil all administrative and academic requirements, achieving a minimum GPA of 2.00, with no grade E. Grade D should not be surpassed to a maximum of 25% of the total credits.
2. Master of Agricultural Engineering: not exceed the maximum study period, have active student status, and fulfil all administrative and academic requirements. Regular program students are required to have a minimum GPA of 3.00, 1 submitted paper to an accredited journal with the minimum status of “under review”, or 1 submitted paper to an indexed international seminar with a minimum status of “accepted”. By Research students are required to have a minimum GPA of 3.25, 1 publication in a reputable journal with a minimum status of “accepted”, or 2 reputable international proceedings in conference with a minimum status of “accepted”.
3. Doctor of Agricultural Engineering: not exceed the maximum study period, have active student status, and fulfil all administrative and academic requirements with no grade C allowed. Regular program students are required to have a minimum GPA of 3.00, 1 publication in an international journal and 1 publication in an accredited national journal or international indexed seminar proceedings with a minimum status of “accepted”. By Research students are required to have a minimum GPA of 3.25, 2 publications in an international journal with Scopus indexed, one publication in an accredited national journal, or an international indexed seminar proceedings with a minimum status of “accepted”

UGM has a policy on academic integrity in educational activities, including examinations and assignments. If students engage in plagiarism, they will face sanctions that correspond

to the severity of their actions. To help prevent plagiarism, the university provides members of the teaching staff and students with access to anti-plagiarism software, which can be used to detect similarities in written work.

i. Thesis

In accordance with academic guidelines, Bachelor's, Master's, and Doctoral students must complete a final thesis or project prior to graduation. The specific modality varies by program and chosen track. This final assignment aims to demonstrate that students are able to work independently on a task at the intended level of the degree program.

Further discussion concerning the Doctoral program is provided in [section D 4](#) of the “Additional Criteria for Doctoral Programs”.

In their assessment of this criterion, the expert group finds that appropriate rules and regulations, which govern the examination systems university-wide, are in place. These rules and regulations are adequately communicated and transparently published.

In response to a survey applied to the students during the audit, 100% indicated satisfaction with the organization of exams. The students confirmed that they were aware of all necessary information regarding examination schedules, forms, and grading rules. They reported that they are provided with sufficient time to prepare for exams and are given the opportunity to complain about their grades due to dissatisfaction.

The expert group also examined a selection of final theses/academic work and determined that they were of an appropriate academic level.

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

UGM does not comment on this criterion in its statement.

The experts consider criterion 2 as fulfilled.

3. Resources

Criterion 3.1 Staff and Staff Development
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Evidence:

- Self-Assessment Report
- Staff handbooks
- Study plans

- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

At UGM, the staff members have different academic positions. There are professors, associate professors, assistant professors and instructors. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, a full professor needs to hold a PhD degree, along with a robust and sustained record of significant research contributions. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position.

The composition of the teaching staff in the programs under review according to their academic position is shown in the following table:

Table 6: Total number of academic staff, 2024
Source: Self-assessment report

Position/education level	SP-BAE	SP-MAE	SP-DAES
Professor	4	4	4
Associate Professor	8	8	8
Assistant Professor	5	5	5
Lecturer	16	-	-
Total	33	17	17
Lecturer-to-student ratio	1:13.8	1:2.5	1:1.7

The experts noted that the number of lecturers for the undergraduate, Master's, and Doctoral programs is 33, 17, and 17, respectively. They asked during the audit if these lecturers are different or if the same individuals teach across all levels. The teaching staff clarified that there are 33 lecturers in total, with 17 who are at least assistant professors teaching in all three programs.

All members of the teaching staff are required to be involved in teaching, research, community service, and administration. As the experts learned during the audit, all teachers have a workload between 12 and 16 credits per semester (one credit equals 170 minutes of activities per week). However, the workload can be distributed differently between the three areas from teacher to teacher. For professors, approximately 35% of their responsibilities involve teaching, while associate professors spend 40%, assistant professors 45%, and instructors 55%. As faculty advance, a greater portion of their time shifts to research, with less focus on teaching.

Regarding promotion, those who are public servants must follow the system regulated by the government. The teaching staff's promotion to a higher academic position is based on several factors, such as achievement in teaching, research (publications), and community service activities.

During the audit, the experts inquired about the time it typically takes for a lecturer to attain the rank of full professor. They learned that teaching staff must meet various requirements regarding publications and research outputs. A lecturer may take up to 10 years to become a full professor. Given this lengthy process and the fact that only about 50% of the teaching staff for the Master's and PhD programs (17 out of 33) hold at least the position of associate professor, the expert team recommends that the university implement an acceleration program to support career development.

Academic staff are housed in the four fields of specialization of the Department of Agricultural and Biosystem Engineering: Biosystem Machinery Engineering, Land and Water Resources Engineering, Food, Postharvest, and Bioprocess Engineering and Biological Environment Control Engineering. They conduct teaching-learning activities, expertise development, research, publication, and community service based on their laboratories' field area.

Apart from the comment above, the experts confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programs.

Staff Development

UGM's Human Resource Management Regulation outlines the development of academic staff through opportunities for higher education and the enhancement of skills, knowledge, and service. The Department of Agricultural and Biosystem Engineering organizes various workshops and training sessions for academic staff based on the Department's Operational Plan.

There are financial resources available for staff members to go abroad for a limited time and to take part at conferences or other events in order to stay up to date with the scientific development in their area of expertise.

Lecturer's performance is evaluated each semester by the faculty under the government assessment system (SISTER). With this system, the performance is not only measured by the teaching activities, supervising activities, research activities but also the community service activities and other activities that lecturers conduct to increase their competence and skills.

During the audit, the experts sought to verify the available development opportunities by inquiring with the teaching staff about the various programs accessible to them. The teaching staff members reported that there is a wide array of programs offered by the university, the faculty itself, and the government for them to collaborate and increase international exposure. They mentioned having access to sabbaticals and noted that many

collaborate with institutions in Europe and Asia. Additionally, some have access to funding mechanisms like ERASMUS, which allows for sending students and staff abroad.

Overall, the teaching staff are highly satisfied with the opportunities to enhance their personal skills and with the internal qualification program at UGM. The institutional support for research is well-recognised by the young academia. There are also numerous opportunities to further develop didactic abilities, as well as the chance to spend time abroad attending conferences, workshops, or seminars. Additionally, sabbatical leave is available for professional growth.

In summary, the experts confirm that UGM offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

Student Support and Student Services

UGM offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is responsible for several students from her or his classes. She or he is a student's first port of call for advice or support on academic or personal matters.

The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. The students confirm during the discussion with the experts that they all have an academic advisor.

In general, students stress that the teachers are open minded and communicate well with them and take their opinions and suggestions into account and changes are implemented if necessary (e.g. shifting the class on scientific writing to the first semester).

All students at UGM have access to the digital academic portal (SIMASTER) which is integrated with the Registration Information System, the Academic Information System, the Library Information System, and the Scholarship Information System. The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via SIMASTER.

There is also medical, social, and psychological support for students at UGM (Gadjah Mada Medical Center/GMC and UGM Hospital). Furthermore, there is the alumni and career center that gives advice to students how to start and run a business.

Finally, there are several student organizations at UGM; they include student's activity clubs, which are divided into arts, sports, religious and other non-curricular activities.

The experts noticed 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 system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them.

Criterion 3.2 Funds and equipment
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Evidence:

- Self-Assessment Report
- Visitation of participating institutes and laboratories
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

UGM is a public university that operates with autonomous status, allowing it to manage its own funding and expenditures. Approximately 25% of UGM's budget comes from government funding, which primarily covers the salaries of all state employees. About 40% of the university's budget is generated from student tuition fees, while the remainder is sourced from industry funding through collaborations, donations, and business revenues from various enterprises.

At the program level, an Annual Work Plan and Budget (RKAT) is prepared by the Dean and head of the Study Program team. This budget, which aligns with the faculty's vision, mission, and strategic goals, is approved by the Faculty Senate and adopted by the Dean. Funds are managed by the faculty and allocated to the various study programs accordingly.

The Department of Agricultural and Biosystem Engineering have the following laboratories:

1. Energy and Agricultural Machinery Laboratory: Emphasizes the principles of engineering and management, specifically in energy and machinery for biomass production and industrial applications.
2. Land and Water Resources Engineering Laboratory: Concentrates on engineering science and management in land and water resources to provide a suitable environment for agroindustry.
3. Food and Postharvest Engineering Laboratory: Focuses on engineering principles in processing, security, and distribution of food and agricultural products from harvesting to industrial process and consumer.

4. Biophysics Engineering Laboratory: Examines the physical properties of plants and animals in response to physical stimuli, energy transfers, and non-destructive analysis of agricultural product.
5. Farm Structure Environmental Engineering Laboratory: Develops science and technology to control the environment in agricultural structure and environment control for crops growth.

Each laboratory have one academic staff member with a doctoral degree serving as the head of the laboratory, along with at least one technician. The technician is responsible for managing all laboratory activities, including practical work and research for students, as well as maintaining all equipment to ensure that these activities can be conducted effectively.

During the audit, the expert group visited the laboratories, classrooms, and library to evaluate the quality of the infrastructure and technical equipment. They noted that there are no significant bottlenecks caused by missing equipment or inadequate infrastructure. Currently, the basic technical equipment for teaching and research is sufficient, and the programs ensure that students can access equipment from other faculties when necessary. **However, the faculty should consider upgrading the existing facilities to align with future requirements.**

The recommendation to place greater focus on the laboratories and equipment available to students was confirmed during discussions with the experts. While students are generally satisfied, a survey conducted during the audit revealed that at least half of them believe there is room for improvement in terms of access to the software required for their study programs and the necessary equipment.

The most critical point from the experts' perspective is that not all of the visited laboratories adhere to international safety standards with respect to safety measures. The university must take action to address this issue, ensuring that all laboratories meet the required safety standards to provide a secure and compliant environment for both students and staff.

The students expressed their satisfaction with the library's services and available literature. The central library provides direct access to international literature, scientific journals, and publications, such as those available via SpringerLink. From the students' perspective, there is adequate access to current international literature and databases, with remote access also being possible. The students particularly appreciate the library's 24/7 access to online resources.

Apart from the abovementioned comments, the experts conclude that the available funds,

the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) comply with the requirements for sustaining the degree programs. They are particularly impressed by the good access to IT platforms to support academic activity.

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

The experts thank UGM for the provided statements and additional documentation concerning criterion 3.

(ASIIN 3.1) Staff development – all three programs

The experts are glad to hear that there has been an increase in the number of senior academic staff in the department, with now five full professors and eight associate professors out of the 33 full-time staff.

They take note that an accelerated career development program for staff has been planned to enable faster academic career advancement and improve lecturer qualifications. While supporting this initiative, the experts emphasize that the planned program must be regularly and continuously monitored and evaluated to support the career growth of lecturers, especially young faculty members.

(ASIIN 3.2) Laboratories for teaching and research – all three programs

The university has outlined various strategies to improve facilities. These include regular surveys to identify essential software needs and feedback mechanisms to prioritize laboratory equipment requirements. A roadmap is being developed to upgrade laboratory infrastructure in line with curriculum updates and industry standards. Additionally, the Agriculture Technology Postgraduate and Learning Centre (ATPLC), featuring advanced laboratories, is under construction and expected to be completed by the end of 2025. Departments are also actively applying for institutional development grants and students are encouraged to utilize the modern research facilities available at the university's central laboratory and other research centers. The experts support these initiatives, emphasizing that the implementation of these strategies must be ensured.

(ASIIN 3.2) Safety standards – all three programs

The university has set up an agenda to ensure a safe and responsible learning environment. Key initiatives include inviting certified Occupational Safety and Health (K3) experts to assess laboratories and recommend improvements to meet international safety standards, implementing mandatory safety training for all students and staff, standardizing safety signage and emergency equipment, and conducting semi-annual fire and chemical spill drills.

While UGM demonstrates a commitment to safety, the experts find the evidence that international standards are consistently followed and verified as insufficient at this stage. The experts reiterate that Occupational Safety and Health (K3) procedures must be available in each laboratory to ensure the safety and health of both staff and students.

Considering the above-mentioned points, the experts regard this criterion mostly fulfilled.

4. Transparency and Documentation

Criterion 4.1 Module Descriptions

Evidence:

- Self-Assessment Report
- Module handbooks
- Ba Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Ma Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Dr Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>

Preliminary assessment and analysis of the experts:

The students, as all other stakeholders, have access to the module descriptions via UGM's homepage.

After studying the module descriptions of all three programs, the experts confirm that they include almost all the necessary information, this is, the teaching methods, the intended learning outcomes, the content, the applicability, the admission and examination requirements, and the forms of assessment.

However, the experts note that the information about the person responsible for the modules is not complete and several descriptions are missing from the program websites. For this reason, the experts expect UGM to complete the module descriptions, making them accessible, in full, to all interested parties.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Diploma/Degree Certificate
- Sample Transcript of Records
- Sample Diploma Supplements

Preliminary assessment and analysis of the experts:

The experts confirm that students from the three programs under review receive a Degree Certificate and an Academic Transcript after graduation. **However, they point out that the Academic Transcript should also list the ECTS points of each course, not only the awarded CSU.**

Along with these documents, the graduates receive a Diploma Supplement, which is an official statement letter issued by the Faculty of Agricultural Technology. It contains almost all necessary information about the degree program, including learning outcomes, acquired soft skills and student achievement in academic, co-curricular, extracurricular, or non-formal education. **However, the Diploma Supplement should include the awarded CSU and ECTS points of the respective degree program.**

For this reasons, the experts expect UGM to correct the awarded documents and to include all required information.

Criterion 4.3 Relevant Rules**Evidence:****Self-Assessment Report**

- Self-Assessment Report
- Ba Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Ma Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>
- Dr Agricultural Engineering website: <https://tpb.tp.ugm.ac.id/en/academic>

Preliminary assessment and analysis of the experts:

The experts confirm that the rights and duties of both UGM and the students are clearly defined and binding. All rules and regulations are published on the university's website and hence available to all relevant stakeholders. In addition, the students receive all relevant course material in the language of the degree programs at the beginning of each semester.

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

The experts thank UGM for the provided statements and additional documentation concerning criterion 4.

(ASIIN 4.1) Module descriptions – all three programs

The experts confirm that module descriptions, are available to all interested parties through the respective program websites. However, based on the review of several

documents, it is recommended to include a matrix linking the Program Learning Outcomes (PLO or CPL) and Course Learning Outcomes (CLO or CPMK), to clearly illustrate the relationship between the CPL and CPMK.

(ASIIN 4.2) Academic Transcript – all three programs

The university has noted that the format and content of the transcript are standardized and centrally managed. Consequently, any changes, such as the addition of ECTS points, require a university-wide policy decision. The experts acknowledge this explanation, but since no actions have been taken/planned, the recommendation to include ECTS credits for each course and the total ECTS on the academic transcript remains in place.

(ASIIN 4.2) Diploma Supplement – all three programs

The experts appreciate the faculty's plan to communicate this recommendation to the relevant authorities at UGM. However, as no actions have been taken, the recommendation to include the awarded CSU and ECTS credits for the respective degree program still stands.

Considering the above-mentioned points, the experts regard this criterion as fulfilled.

5. Quality management: quality assessment and development

Criterion 5 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Academic Guidelines
- Sample students' questionnaire
- Results from tracer studies
- Discussions during the audit

Preliminary assessment and analysis of the experts:

During the audit, the experts held discussions about the quality management system at UGM with program coordinators and students. They learned that there is an ongoing process aimed at improving the quality of the degree programs, which is achieved through both internal and external evaluations. The quality assurance system at UGM is overseen by the Quality Assurance Office (KJM), with support from the Quality Management Unit (QMU) at the faculty level.

The faculty conducts internal evaluations through an audit guided by ISO 9001:2015, focusing on the study program and supporting units, including laboratories. Additionally, the Internal Quality Audit (AMI) evaluates the study program yearly through documentation reviews and alternating site visits. Each audit concludes with a Management Review Meeting at both the department and faculty levels to discuss findings and follow-ups, which the auditors later verify.

Important sources of insights for improving the quality of degree programs include student and alumni surveys, specifically the annual tracer studies conducted by the university. Students provide feedback on their courses by completing an online questionnaire (EDOM). It is mandatory for students to give feedback on their classes; failure to do so will restrict their access to their accounts on the digital platform SIMASTER.

The online questionnaire covers 12 areas, including adherence to the lecture schedule, effective use of lecture time, lecture planning, materials provided, knowledge of the lecturer, opportunities for discussion, assignments, assessments, and more. The course surveys are conducted during final exam week, and a compilation of student feedback is sent to the respective lecturers. During the discussion with the experts, the students also expressed that there is an option for providing direct and informal feedback to their lecturers. In response to a survey conducted during the audit, all the students indicated that they feel their contributions toward improving the program are taken seriously.

The experts also learned that the results of the surveys are accessible by the students and the members of the teaching staff. If there is negative feedback, the Dean talks to the respective lecturer, analyses the problem, and offers guidance. Furthermore, there is a complain box for the students that can be used for suggestions or criticism. The experts appreciate that UGM fosters an atmosphere of continuous improvement within the programs.

Aside from such internal quality assurance mechanisms, recurring external quality assurance exercises at UGM and the Faculty of Agricultural Technology are related to the legal obligation to submit every degree program for national accreditation in addition to the compulsory institutional accreditation. The Bachelor Agricultural Engineering has attained accreditation “Excellent” by the National Accreditation Board for Higher Education (BAN-PT). The Master and Doctoral programs have achieved “A” accreditation by the same national agency.

To keep the communication with the alumni, the Faculty of Agricultural Technology provides several social media platforms to inform about job opportunities, continuous development through offline or online seminars, and information on scholarships for Master’s and Doctoral programs at UGM or overseas.

The experts discussed with the representatives of UGM's partners from public institutions and private companies if there are regular meetings with the partners on faculty level and how they are involved in further developing the degree programs. They learned that some employers are invited to give their feedback on the content of the degree program and are members of the curriculum committee. In addition, partners from the industry are invited to give lectures. As the experts consider the input of the employers to be very important for the further improvement of the degree programs, they appreciate the existing culture of quality assurance with the involvement of employers in the quality assurance process.

In summary, the expert group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programs. All stakeholders are involved in the process.

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

UGM does not comment on this criterion in its statement.

The experts consider criterion 5 to be fulfilled.

D Additional Criteria for Structured Doctoral Programs

Criterion D 1 Research

Evidence:

- Self-Assessment Report
- Samples of student dissertations and publications
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

The primary focus of the doctoral program, both in the Regular and By-Research streams, is on research. In the Regular program, dissertation research accounts for approximately 73-79% of the total credits, while in the By-Research program, it makes up about 86-89% of the total credits. The program is dedicated to research that seeks to advance new scientific knowledge or technological innovations in the field of agricultural engineering and biosystems, with an emphasis on:

Research Areas

1. Biosystem Engineering
2. Land and Water Resources Engineering
3. Food Engineering, Post-harvest, and Bioprocess Engineering
4. Environmental Biotechnology Engineering

Research is conducted through interdisciplinary, multidisciplinary, and transdisciplinary approaches. Research topics for doctoral students can be part of the research umbrella of the supervisors or come from the students. Several research financial supports come from scholarship sponsors, universities, or the government.

The experts appreciate the research focus of the program and commend the good level of collaboration across faculties and with external partners. **However, they request that the research map of the Department of Agricultural and Biosystems Engineering be published on the website to further enhance visibility and engagement among relevant stakeholders.**

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion D 1

After reviewing the provided link, the experts confirm that the Department of Agricultural and Biosystems Engineering's research map is now publicly accessible on the department's website.

The experts consider criterion D 1 to be fulfilled.

Criterion D 2 Duration and Credits

Evidence:

- Self-Assessment Report
- Academic Guideline
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

The Doctor in Agricultural Engineering Science consists of a minimum of 46/44 (Regular/By research) Indonesian credits (*Satuan Kredit Semester*, CSU). The expected study duration is six semesters (3 years) with student intake each semester. In regard to the maximum duration, UGM implements a limit of seven years (14 semesters) in line with government regulations. An extension of the study period may be granted only under special circumstances.

The structure of the program is determined by the student's chosen pathway: Regular or By Research. The curriculum of both tracks includes:

Coursework: 23.04-30.72 ECTS (Regular track) or 11.52-15.36 ECTS (By Research track). In the first semester of the program, students are required to complete a set of core and elective courses.

Research : 87.04 ECTS (Regular track) or 97.28 ECTS (research track). For the last five semesters, doctoral students must develop a research proposal, reviewed and approved by their promotor team to ensure feasibility and academic rigor. Passing these exams confirms their readiness for the research phase. During the research phase, students submit progress reports, detailing their work, methodology, and future plans, which the promotor team reviews to gauge progress and provide feedback. The program culminates in the dissertation, which should be an original contribution to the field. The dissertation's quality and completeness are crucial for assessing the student's research skills. Finally, students must defend their dissertation in an oral examination.

Publication and Presentation: To graduate from the Doctoral study program, students must meet specific publication requirements based on their program type:

1. Regular Program: Students are required to produce a minimum of 2 publications. This includes: 1 publication in an international journal and 1 publication in a nationally accredited journal. Alternatively, students can present their research at an international seminar and publish their paper as a proceeding.
2. By-Research Program: Students must produce a minimum of 3 publications. This includes at least 2 publications in international journals, 1 publication in a nationally accredited journal or 2 publications in international journals and 1 international proceeding.

Students have the opportunity to enhance their experience and skills through activities outside the study program, or even outside the university.

The experts see that the workload and duration are in accordance with the feasibility of a doctoral study program. Doctoral students confirmed during the audit that the workload is in general manageable, allowing them to maintain a balance between studies and other commitments. **However, there are many Doctoral students, who cannot finish the program in time. As noted in Criterion 1.5, the average length of study is over 5 years.**

During the audit, the experts identified that the publication requirement poses a significant barrier to the timely completion and expect that measures be implemented to address this challenge.

Overall, based on the provided documentation and their discussions during the audit, the expert group attests that courses within the Doctoral program serve to achieve the

intended academic qualification. Through the offered structure, students are able to individualise their doctoral journey.

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

The experts appreciate the university's awareness of the issue of delayed graduation in the doctoral program. However, the planned actions must be effectively implemented and lead to measurable improvements in graduation timelines each year.

The experts consider criterion D 2 to be partially fulfilled.

Criterion D 3 Soft Skills and Mobility

Evidence:

- Self-Assessment Report
- List of cooperations
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

Doctoral candidates are offered a range of activities designed to enhance their personal and professional development. At UGM, students can engage in academic writing workshops in partnership with Springer Nature Masterclasses, along with sessions focused on citation practices, reference management, and anti-plagiarism tools. Additionally, the department and faculty host guest lectures featuring both national and international experts, and they offer financial assistance for attending national and international seminars or training programs.

However, the data reveals that only a few doctoral students have participated in academic activities abroad as part of their studies. In 2024, one student attended a seminar and training at BOKU in Austria, while two students attended a seminar in Malaysia.

The Self-Assessment Report indicates that students receiving scholarships from the Indonesian Government and those in the fast-track program from Master's to Doctoral studies are provided with financial support for international mobility. Additionally, both UGM and the Indonesian Government offer research funding for Doctoral students, which can be used for mobility purposes. However, the faculty acknowledges that not all doctoral students have participated in collaborative international efforts and recognizes the need to increase research incentives for international collaboration.

As highlighted under Criterion 1.3, the experts support this initiative and recommend expanding efforts to further internationalize UGM. This includes establishing more

international cooperation and exchange programs, along with offering additional and better-funded scholarships.

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

Addressed under Criterion 1.3

The experts consider criterion D 3 to be fulfilled.

Criterion D 4 Supervision and Assessment

Evidence:

- Self-Assessment Report
- Academic Guideline
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

Every Doctoral student is allocated a supervisor team comprised of 1 promotor and 1 or 2 co-promotor. The promotor is a lecturer at the Faculty of Agricultural Technology who holds a Doctorate degree and has previous supervision experience. Co-promotors can come from institutions outside UGM.

The final scientific work in the Doctoral program is a dissertation. This work is based on research results and follows scientific methods and principles. As shown in figure below, to arrive to this final stage, students must complete several stages:

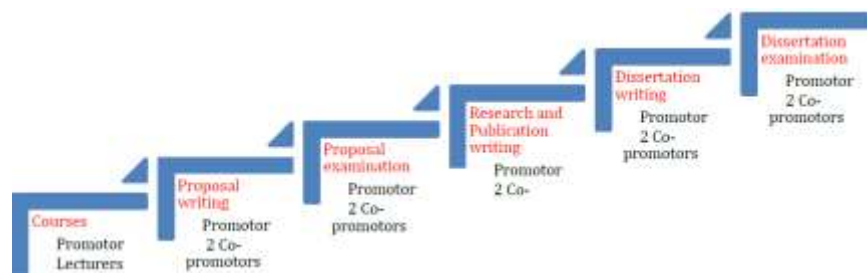


Figure 1: Stages and mechanisms for completing a doctoral degree and related persons in charge
Source: Self-Assessment Report, UGM

The promotor is appointed after a student is accepted, based on their research interests and workload. Before classes begin, the Promotor and the student collaboratively select the elective courses for the first semester. During the Special Topic course, they also have the opportunity to begin discussing a potential research topic.

The two co-promoters are appointed in the second semester, and the student, with guidance from the supervisory team, drafts a research proposal. This proposal is then presented during the proposal examination, where it is reviewed by three reviewers, who may be from either within or outside of UGM.

The student is officially designated a 'Doctoral Candidate' after passing the proposal examination. Following this, the candidate can begin their research under the supervision of the supervisory team. Progress is monitored through mandatory seminars held each semester, which contribute 5% to the final dissertation grade.

To graduate, doctoral candidates must meet publication requirements. Once fulfilled, they submit their dissertations after receiving approval from three reviewers. After gaining approval from all reviewers and the supervisor team, the dissertation is then examined by a dissertation examination committee. This committee consists of nine members: three reviewers, three members of the supervisor team, two external examiners, and one chairperson. The examination is conducted using a standardized dissertation examination form.

The final mark of the dissertation consists of 1) Proposal and Proposal Examination (40%), 2) Seminar (5%), 3) Publication (5%) and Dissertation Report and Dissertation Examination (50%).

The experts confirm that a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution is in place and continuous support by their supervisors is provided. Assessment rules are clearly formulated and binding.

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

The experts consider criterion D 4 to be fulfilled.

Criterion D 5 Infrastructure

Evidence:

- Self-Assessment Report
- Visitation of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the experts:

As highlighted by UGM in its Self-Assessment Report and during the audit, Doctoral students can draw from a range of facilities and resources, including dedicated workspaces, research labs, as well as library access to books, journals, and anti-plagiarism checkers.

The experts visited the facilities provided for Doctoral students at the Faculty of Agricultural Engineering to assess the infrastructure and technical equipment. **As noted under Criterion 3.2, while the experts consider the current equipment and facilities adequate for supporting research activities, they recommend considering upgrades to meet future needs and evolving requirements.**

Other than that, the experts attest that Doctoral candidates are provided with an adequate research environment that allows them to appropriately carry out their research projects.

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

Addressed under Criterion 3.2.

The experts consider criterion D 5 to be fulfilled.

Criterion D 6 Funding

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Funding for research is accessible through multiple sources, including the university itself, research grants from the Indonesian government, or external organisations, the latter drawing from UGM's network of industry partners. Further relevant aspects are discussed under criterion 3.2.

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

The experts consider criterion D 6 to be fulfilled.

Criterion D 7 Quality Assurance
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Evidence:

- Self-Assessment Report

- Statistical data for the Doctoral program
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

Based on the data provided in the self-assessment report, the experts confirm that UGM collects student progression data, including average study time, drop-out rates and GPA averages for each doctoral student cohort.

The experts attest that academic guidelines are provided to the doctoral students to support their doctoral journey. Further relevant aspects are discussed under criterion 5 and criterion D 4.

Final assessment of the experts after the comment of the Higher Education Institution regarding criterion D 7:

The experts consider criterion D 7 to be fulfilled.

E Additional Documents

Before preparing their final assessment, the experts ask for the following missing or unclear information together with the comment of UGM on the previous chapters of this report:

- none

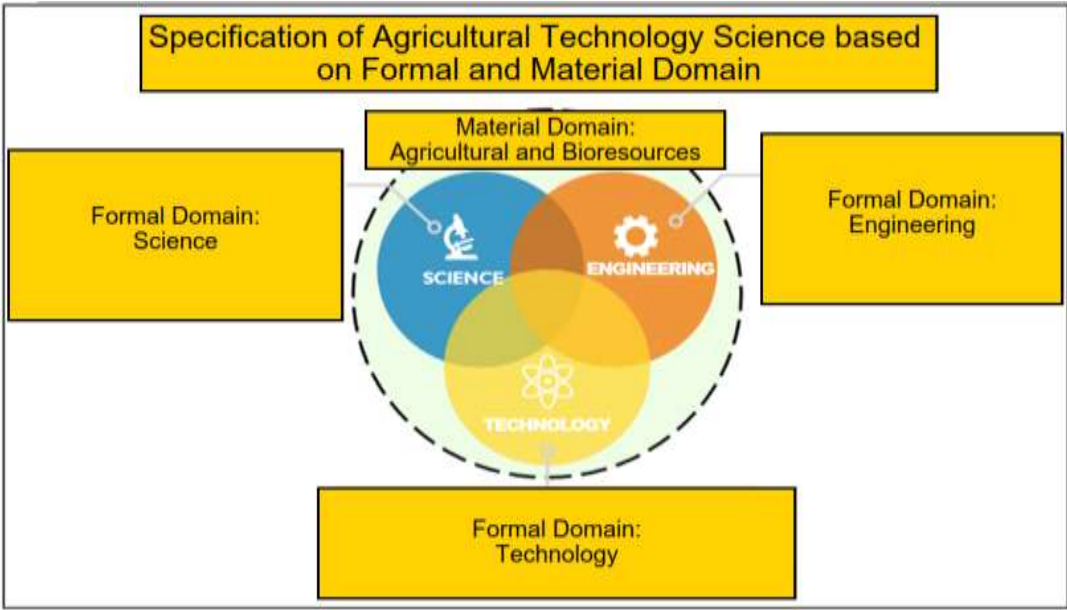
F Comment of the Higher Education Institution (02.05.2025)

The institution provided the following additional information [links have been deactivated]:

No	Experts' statement	Response related to the statement and evidence (if applicable)
1.	Criterion 1.1 Objectives and Learning Outcomes of a Degree Program (Intended Qualifications Profile). Page 9. During the audit, the experts focused on the graduate profiles of the master's and doctoral programs, noting the expectation for graduates to become entrepreneurs. However, they observed that there are no specific courses dedicated to entrepreneurship within the curriculum. The program coordinators confirmed	This point is relevant to MAE and DAES: Thank you for your valuable feedback. We acknowledge that although entrepreneurship has been included in our Program Learning Outcomes (PLO) since the 2021 curriculum revision, there are no specific courses dedicated to this area in either the Master's or Doctoral programs due to credit limitations. Only a few Master's courses, such as Industrial Agricultural Management Systems and Mechanized Agricultural Systems Management, are somewhat related to entrepreneurship, while the Doctoral program currently offers no specific courses in this field. Nevertheless, we have been enriching students' entrepreneurial skills through guest lectures and optional programs such as UGM-Preneurs in collaboration with PT. BIG (Bawa Indonesia Global), WIRAGAMA UGM, and others. However, these initiatives are not formally integrated into the curriculum. Additionally, both the Master's and Doctoral programs foster competencies related to entrepreneurship and motivation through various activities, such as promoting innovation, technology transfer, independent projects, and product commercialization. These values are embedded within coursework activities, research projects, industrial visits, and the thesis and dissertation topics.

	this, explaining that while there are no dedicated entrepreneurship courses, the faculty occasionally invites industry professionals to give talks on the topic. A training program is also available for students who wish to enhance their entrepreneurial skills. Based on these discussions, it is clear that entrepreneurship skills development is largely left to the students themselves. An important recommendation for the faculty is to establish a clear, structured approach that actively supports the development of entrepreneurial skills among these students.	Despite these efforts, tracer studies indicate that very few of our graduates pursue entrepreneurship after completing the program. Most graduates who become entrepreneurs had already established their entrepreneurial activities before entering the program. In response to this, we have revised our PLO by removing "entrepreneur" from the graduate profiles to better reflect the actual career trajectories of our Master's and Doctoral graduates and to ensure consistency between learning outcomes and curriculum design. See: https://tpb.tp.ugm.ac.id/en/curriculum-of-master-program-2 for MAE and https://tpb.tp.ugm.ac.id/en/curriculum-of-doctor-program for DAES. Although entrepreneurship will no longer be formally listed as part of the graduate profiles in the Master's and Doctoral programs, we remain committed to fostering entrepreneurship (entrepreneur spirit) among our students through various supporting activities.
2.	Criterion 1.2 Name of the Degree Program Page 11	This point is relevant to MAE and DAES: We would like to clarify that since 2011, the Indonesian Society of Agricultural Engineering (ISAE) has formally proposed that Agricultural Engineering and Biosystems Engineering programs be classified under the engineering field of study. This was officially approved in 2019

	However, feedback from stakeholders suggested that the degree awarded should more accurately reflect the program's profile. In light of this, the experts recommend that the university consider awarding the degrees as Bachelor/Master of "Agricultural Engineering" rather than Bachelor of Agricultural Technology/Master of Science, in order to better align with the program's objectives, learning outcomes, and curriculum.	through a national directive issued by the Directorate General of Higher Education (DIKTI) and further updated in 2022. However, Universitas Gadjah Mada (UGM), as a Legal Entity State University (PTN BH), has full autonomy over the establishment and governance of its academic programs, as regulated by the Ministry of Education (2006). In 2017, UGM issued a Rector's Decree 1718/UN1.P/SK/HUKOR/2017 that degree titles within the Faculty of Agricultural Technology would remain as Bachelor in Agricultural Technology and Master of Science. Legally, at PTN BH institutions like UGM, a Rector's Decree holds higher authority than a Directorate General Regulation. Therefore, regarding degree titles, our programs are currently aligned with university policy. Nevertheless, both undergraduate and graduate programs maintain a strong engineering foundation in their curricula as mandated by the faculty, which has been approved by the Senate of the Faculty of Agricultural Technology as shown in the following Figure. The faculty as an educational unit within a discipline cluster with similar characteristics, focuses on characterizing a scientific field based on its formal and material domain. This characterization serves as the foundation to clearly define the field's specification. Thus, the foundation for specifying the Agricultural Technology field of study is built upon the understanding of <i>Formal Coverage</i> and <i>Material Domain</i> as follows: a) Formal Domain: <i>Science-Technology-Engineering.</i> Science-Technology-Engineering represents an integrated set of methods, tools, or instruments specifically used to observe, understand, design, and engineer material objects. b) Material Domain: <i>Tropical Agricultural Biological Resources.</i>
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		Tropical agricultural biological resources refer to the material objects targeted for study within the formal domain. Material Domain of agricultural biological resources is specifically focused on tropical regions, serving as the subject matter approached using the instruments and tools of Science-Technology-Engineering, as visualized in the following Figure. This visualization of the specification of the Agricultural Technology field based on Formal and Material Domain expresses the development of the Agricultural Technology discipline as a unified and integrated field of study. 
3.	Criterion 1.3 Curriculum	This point is relevant to BAE, MAE and DAES:

	Page 15 The experts recognize that UGM has already initiated national and international collaboration with different institutions to provide international mobility opportunities for students. However, as the number of students who spend time abroad remains relatively low, they recommend increasing the effort to further internationalize UGM by establishing more international cooperation and exchange programs and offering more and better-endowed scholarships.	Criterion 1.3.2. Student Mobility We acknowledge that in the last 4 years, the number of students participating in international programs is still relatively low. This condition is primarily due to Covid 19 pandemic. Before the COVID-19 pandemic, the department regularly conducted student exchange programs, for example with Maejo University (Thailand), Universiti Putra Malaysia (Malaysia), the SUIJI Consortium (Japan), etc (Appendix: Example of the mobility). These activities were conducted on a reciprocal basis. However, during and after the COVID-19 pandemic, these activities were temporarily suspended. After the COVID-19 pandemic is fully overcome, the department has resumed its student exchange programs with both existing and new partners. According to annual data, the number of students participating in exchange programs has shown an increasing trend. This has been further supported by government programs, such as the Merdeka Belajar Kampus Merdeka (MBKM) initiative. Through this program, some students have traveled abroad, including to Boku University (Austria) and UC Davis (USA). In addition to external funding, the department also allocates internal funds to support international mobility. In 2024, six master's students and three doctoral students participated in mobility programs to UPM Malaysia with departmental funding. In 2025, it is planned that 15 master's students will engage in mobility programs at Chulalongkorn University and AIT (Thailand). (Appendix: Example of the mobility after Covid 19). Our department has long been committed to supporting international student mobility. Over the past 15 years, we have partnered with three Japanese universities through the SUIJI
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	consortium, allowing both undergraduate and master's students to participate, though the number of spots is limited and highly competitive. Additional efforts include: 1. A student exchange program with Maejo University, Thailand, for undergraduate research (paused during COVID-19). 2. Annual participation in the ASEAN Agricultural Engineering Student Convention i.e., student competition. (Appendix). 3. Department-funded international mobility for master's and doctoral students since 2022. (Appendix). 4. Growing participation in UGM's International Joint Supervision scheme, with students recently visiting partner universities in Japan, Malaysia, and Belgium. (Appendix: Belgium, Malaysia, Japan) 5. Ongoing collaboration with BOKU University through Asia UNINET for over 10 years. (Appendix). Moving forward, we are committed to increasing these opportunities through: 1. Expanding participation in International Joint Supervision programs. (Appendix: Recipient of Joint Supervision Grant) 2. Enhancing student competitiveness for international programs like SUIJI and others which facilitate student mobility. 3. Increasing the number of collaborative research proposals under "Riset Kolaborasi Indonesia (RKI)" scheme C which involves international partners. (Appendix: Summary RKI). 4. Establishing more student exchange agreements with overseas universities.
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		5. Continuing to allocate department-level funding for international mobility. The department has allocated funds to support student mobility. In early 2025, the department sent 5–6 students to participate in an ARC student competition in Thailand (Appendix). In June, the department will fund the mobility of 15 master's students for a short visit to Thailand. 6. Reactivating our student exchange program with Maejo University and Universiti Putra Malaysia (UPM). We received and are applying for a grant for these activities from SEARCA. (Appendix).
4.	Criterion 1.3 Curriculum Page 16 Furthermore, the experts note that in alignment with the programs' aspirations to enhance their presence on the international stage, improving the English language proficiency of students and teaching staff becomes a critical area of development. It is recommended that the university consider increasing the integration of English in the study programs, as a survey conducted during the	This point is relevant to BAE, MAE, and DAES: The development of English language skills among both students and teaching staff is a continuous priority, with efforts undertaken by both individual lecturers and the department/study program. The following measures will be further strengthened: At the Lecturer Level: 1. Enhancing students' exposure to English by using English-language materials (e.g., PowerPoint slides, reading resources) during lectures, even if the instruction is delivered in Indonesian. 2. Assigning tasks that require the use of English, such as reviewing journal articles or writing essays based on English-language sources. 3. Increasing the number of guest lecturers from international institutions who deliver sessions in English. (Appendix)

meeting with students revealed that several expressed a desire for more English content. Additionally, when asked to evaluate the English skills of their lecturers and supervisors on a scale from 1 to 5, the responses were as follows: 35% rated them a 5, 45% a 4, and 20% a 3. In light of this feedback and to support the internationalization objectives of the three programs under review, the experts recommend that measures be taken to further enhance the English language skills of both students and teaching staff.	4. Encouraging students to present their findings at international seminars—both within and outside UGM — and to publish their work in English-language journals. (Appendix). At the Faculty/Department/Study Program Level: 1. The Faculty of Agricultural Technology encourages lecturers and administrative staff to improve their English language skills. The Dean of the Faculty has issued a Letter containing directives and regulations aimed at increasing international activities and enhancing English proficiency among both lecturers and students (Appendix). 2. Promoting active participation of lecturers in international seminars and conferences. Encouraging faculty members to prioritize publishing in international journals over national ones. To facilitate the publication of manuscripts in reputable international journals by both lecturers and students, Universitas Gadjah Mada offers several types of grants accessible to lecturers and students. These include thesis-to-article conversion, language editing support, open access journal funding, and publication clinics. (Appendix) 3. Expanding the number of courses offered in English. Universitas Gadjah Mada. Universitas Gadjah Mada provides a 'Team Teaching' grant that can be used to invite lecturers from other countries to co-teach students in study programs at UGM. This initiative enhances students' international exposure. (Appendix) 4. Reactivating student exchange programs, particularly with partner universities in Asia, to increase the presence of international students in classes—thereby creating a natural environment for English-medium instruction. (Appendix) 5. Encouraging and supporting the PERMATETA (Student Association) English Club to foster an English-speaking culture among students.
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		6. Maintaining a strong commitment to allocating budgetary support for international activities for students. The department of Agricultural and Biosystems allocates about 10% of the budget for student mobility. 7. Financing faculty members to attend scientific English language training, particularly for further studies and publication purposes. (Appendix) 8. Assigning faculty members, especially younger lecturers, to attend the English Bridging Course, an English language training program organized by the Directorate of Higher Education. (Appendix) 9. Opening opportunities for foreign students to conduct short visits or research at the Department of Agricultural and Biosystems Engineering. For example, currently, there are two students from Japan and one student from France conducting research/internships/lectures (Appendix).
5.	Criterion 1.5 Workload and Credits Page 23 Since the workload of the students is an estimation by each study program, the experts expect UGM to verify the students' total workload and adjust the awarded ECTS points for each course accordingly. This could be done, for example, by including a respective question in	Response related to BAE, MAE, and DAES: Thank you for the valuable feedback. At UGM, the total credit (SKS) load follows national regulations, not individual program estimations. The description of CSU was written in the SAR Criterion 1.5. Workload and credits, page 36 (Appendix). The information of CSU has been outlined in the faculty's academic handbook, stated as follows: Student workload is based on a credit system expressed in terms of Credit Semester Units (SKS). A Credit Semester Unit (SKS) is the measure of time allocated to learning activities for a student per week per semester in the learning process through various forms of teaching or the recognition of a student's successful efforts in participating in curricular activities in a study program. A semester is the unit of time for effective learning processes lasting at least 16 weeks consisting of 14 face-to-face sessions, plus 2 weeks for mid-semester exams and final

the satisfaction questionnaires. In any case, UGM must make sure that the actual workload of the students and the awarded ECTS credits correspond with each other and make that information transparent in the module descriptions and the study plans.	exams. The student's learning workload for 1 (one) SKS is equivalent to three hours of weekly education activities. Since there are 16 weeks in a semester, then 1 SKS is equal to 48 hours of educational activity in one semester. Student workload or educational activities mainly comprised lecturers, laboratory activities, and final projects, such as internships, research, and community services. One (1) SKS for lecturers consists of 3-hour activities (equivalent to 170 minutes), i.e., 50 minutes contact-hour with the lecturer, 60 minutes of task completion, such as finishing homework, writing essay papers, etc., and 60 minutes of self-study. For laboratory and other psychomotor skills or physical activities, including community services, 1 SKS workload equals 2 to 3 hours of physical or psychomotor activity, plus one hour of task completion (writing laboratory report) and one hour for self-study. So, the total is 4 to 5 hours a week or 64 to 80 hours a semester. The calculation of the SKS for an internship is as defined as for laboratory practice, which is 4 - 5 hours a week or 64 - 80 hours in a semester. For research, the calculation of the SKS is like the calculation for physical and psychomotor activities, i.e., one research SKS is an activity for 64 - 80 hours a semester. The research that must be carried out by students for the preparation of research (skripsi) to obtain a degree is rated 4 SKS, including the final examination. Based on the above definition, the conversion to ECTS is managed by each study program, following the University regulation NOMOR 4732/UN1.P.I/Dir-PP/KR.01.02/2023 and based on the learning methods used to achieve specific learning outcomes. The Rector's Decree only provides guidelines for ECTS conversion in the form of a "range of values," namely 1 CSU (SKS) = 1.5 to 1.8 ECTS. The determination of the exact conversion value is delegated to each study program, allowing them to adjust based on their specific learning objectives and methods.
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		During curriculum design, student input is included, and workload transparency is ensured through the course planning documents (RPKPS) provided at the beginning of each course. UGM also implements several mechanisms to verify student workload, including internal and external audits, satisfaction surveys, and EDOM (online teaching evaluations). Most importantly, course workload is carefully managed to ensure the achievement of learning outcomes. To ensure that students' workload is manageable and in accordance with the number of credits they are taking, the faculty and departments conduct annual surveys on learning activities. Based on the survey results from undergraduate, master's, and doctoral students, more than 95% of respondents stated that their academic workload aligns with the regulations and that they found it appropriate. (Appendix: Result of the survey). The information about workload is written in module description and study plans. They can be accessed by stakeholders through our website. We have completed the module description on our website. BAE: https://tpb.tp.ugm.ac.id/en/curriculum MAE: https://tpb.tp.ugm.ac.id/en/curriculum-of-master-program-2 DAES: https://tpb.tp.ugm.ac.id/en/curriculum-of-doctor-program
6.	Criterion 1.5 Workload and Credits Page 23 During the audit, the experts learned that the publication	This point is relevant to MAE and DAES: We acknowledge the assessors' valuable feedback regarding the publication requirement as a potential barrier to timely graduation, particularly for Master's and Doctoral students. At our university, the policies are as follows:

requirement seems to be a significant barrier to timely completion for Master's and Doctoral students. The experts believe that measures needs to be implemented to address this challenge and ask the university to enhance its assistance for student progression to promote timely graduation (e.g., mandatory workshops, seminars etc.).	1. For Master's students, the requirement is more flexible. A manuscript only needs to be under review, and it can be submitted to a national journal or international seminar proceedings as an alternative. 2. For Doctoral students, the publication in an international journal is a mandatory requirement based on national regulations and UGM policy. We recognize that several external challenges may delay publication, such as: 1. Long peer-review and revision periods in reputable journals. 2. Limited availability of appropriate journals in specific niche areas. 3. Language barriers and writing skills. 4. Limited networking opportunities with international academic communities. Despite these challenges, several support mechanisms have been implemented (Appendix): 1. Language editing services for students writing in English. 2. Support for international seminar participation to facilitate early dissemination of research. 3. Research funding is provided with clear output targets, including mandatory accepted publication 4. Publication incentives for students with accepted/published articles. 5. Establishing a database of suitable journals by field and scope to help students target their manuscripts more efficiently. (Appendix). 6. A Journal Clinic, organized by the study program, will be held at least once every semester to guide students through the publication process. The closest agenda will be held on Thursday 8 May 2025 for Masters and Doctoral students.
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7.	Criterion 3.1 Staff and Staff Development Page 30 During the audit, the experts inquired about the time it typically takes for a lecturer to attain the rank of full professor. They learned that teaching staff must meet various requirements regarding publications and research outputs. A lecturer may take up to 10 years to become a full professor. Given this lengthy process and the fact that only about 50% of the teaching staff for the Master's and PhD programs (17 out of 33) hold at least the position of associate professor, the expert team recommends that the university implement an acceleration program to support career development.	This point is relevant to BAE, MAE and DAES: We appreciate the experts' observation regarding the career progression of academic staff. Following the ASIIN visitation, there has been an increase in the number of senior academic staff in our department. Currently, we have 5 full professors and 8 associate professors of 33 full time staff, which represents significant progress. The requirement to become a full professor in Indonesia—particularly the obligation to publish as the first author in reputable international journals—remains a significant challenge. Nevertheless, there is already strong commitment and monitoring from both the Ministry of Education and UGM through the KPI system via Sister every semester, which include publication targets for promotion. Several measures are already in place: 1. Semester-based monitoring of publication performance at the university and department level. 2. Research grants with mandatory publication outcomes in international journals. 3. Incentives for international journal publications for academic staff. (Appendix) To accelerate the career development of our staff, particularly from associate professor to full professor, the department will implement the following strategies: A letter containing directives and regulations aimed at enhancing international activities and the quality of human resources, issued by the Dean of the Faculty (Appendix), was then elaborated into several departmental policies as follows:
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		1. Identification and tracking of publication records, including authorship position, to support strategic planning toward promotion. 2. Reactivation of research groups to foster collaborative publications and strengthen research output. 3. Targeted support for associate professors, including financial incentives and technical assistance (e.g., manuscript review, translation, journal targeting). 4. Establishment of mentorship schemes, pairing senior faculty with junior/associate professors to guide publication strategies. 5. Regular workshops and clinics on international journal writing and submission. 6. Encouragement to submit existing unpublished research into suitable international journals with institutional support. 7. The faculty facilitates the promotion process directly, no longer on a periodic basis. Whenever a promotion proposal is submitted, the documents will be processed immediately. 8. The faculty regularly reports the progress of faculty members' promotions every month during the Faculty Coordination Meeting.
8.	Criterion 3.2 Funds and equipment Page 33-34 However, the faculty should consider upgrading the existing facilities to align with future requirements. The recommendation to place	This point is relevant to BAE, MAE and DAES: We thank the experts for the constructive feedback regarding laboratory equipment and software accessibility. While students have expressed general satisfaction, we acknowledge that continuous improvement is essential to align with future academic and research needs. To address this, Department have already taken several steps:

	greater focus on the laboratories and equipment available to students was confirmed during discussions with the experts. While students are generally satisfied, a survey conducted during the audit revealed that at least half of them believe there is room for improvement in terms of access to the software required for their study programs and the necessary equipment.	1. Each laboratory has a dedicated budget (Annual Budget Allocation, RKAT) for upgrading and maintaining equipment. Some equipment has also been improved through external grants such as PKKM and PUAPT schemes. 2. In cases where equipment procurement is not feasible, we actively engage in resource-sharing collaborations with industry partners, allowing students to access advanced tools and technologies outside campus. 3. UGM is committed to supporting the purchase of licensed software, especially when there is significant student demand across courses or departments. 4. For specialized software that cannot be purchased due to cost or limited use, study programs encourage students to use open-source alternatives. With the integration of AI tools, students are now more empowered to write and adapt code independently. 5. UGM has been organizing training and tutorials on using both licensed and open-source software. Additionally, we are going to add other Strategies, such as: 1. Conduct regular surveys and coordination with course instructors to identify essential software needs for each semester. 2. Strengthen our feedback mechanisms (e.g., course evaluations, satisfaction surveys) to continuously identify and prioritize laboratory equipment needs. 3. Develop a roadmap for gradually upgrading lab infrastructure in alignment with new curriculum directions and industry standards. 4. The faculty is currently building the Agriculture Technology Postgraduate and Learning Centre (ATPLC), which will be equipped with advanced, standardized laboratories and equipment. This will be finished at the end of 2025. (Appendix: Master plan of the building)
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		5. The departments and faculties have become increasingly active in applying for institutional development grants. For example, in 2021-2022, the Department of Agricultural and Biosystems Engineering received the PKKMM Grant (Indonesian Higher Education), and in 2024-2025, the faculty received the PUAPT Grant (Indonesian Higher Education). With the funding from these grants, advanced, standardized laboratories and equipment can be purchased. (Appendix: Laboratory Equipment, bought in 2024 and will be bought in 2025) 6. The department encourages students to more actively utilize the modern research facilities available at the university's central laboratory, the Field Research Center (FRC) at UGM, the JICA Learning Center, and others.
9.	Criterion 3.2 Funds and equipment Page 34 The most critical point from the experts' perspective is that not all of the visited laboratories adhere to international safety standards with respect to safety measures. The university must take action to address this issue, ensuring that all laboratories meet the required safety standards to provide a secure and compliant	This point is relevant to BAE, MAE and DAES: Ensuring a safe and secure working environment for both students and staff is indeed a top priority for the department and faculty. We would like to clarify that many of our laboratories already follow international safety standards, supported by our compliance with ISO 17025 (for testing and calibration laboratories) and ISO 9001 (for quality management systems). (Appendix: certificate) In addition, we have already conducted Regular Internal and External Audits conducted annually, both internally and externally, to evaluate compliance and identify areas for improvement. We acknowledge that there are still areas needing improvement. Therefore, the faculty and department have committed funding specifically for enhancing lab safety infrastructure and training. (Appendix: Audit) We will make the following agenda to achieve safe and responsible learning environments:

	environment for both students and staff.	1. We plan to invite certified K3 (Occupational Safety and Health) experts to conduct assessments and provide tailored recommendations for aligning all laboratories with international safety standards. 2. Implement mandatory safety training for all students and staff prior to using laboratory facilities. 3. Standardize and update safety signage, evacuation plans, and ensure the presence and usability of emergency equipment (e.g., eyewash stations, fire extinguishers, evacuation routes) 4. Periodic Safety Drills: Conduct semi-annual fire and chemical spill drills to prepare students and staff for emergency situations. The funding needs will be covered by the budgets of both the Department and the Faculty. In addition, grants offered by the government and Universitas Gadjah Mada will also serve as alternative funding sources. (Appendix)
10.	Criterion 4.1 Module Descriptions Page 35 However, the experts note that the information about the person responsible for the modules is not complete and several descriptions are missing from the program websites. For this reason, the experts expect UGM	This point is relevant to BAE, MAE and DAES: We acknowledge the importance of module descriptions and information about the course. In response to the experts' suggestion, we have added the module description available on the department's website. 1. (Appendix: Module description Indonesia, Modul description English for bachelor Program) 2. (Appendix: Module description Indonesia, Modul description English for Master Program) 3. (Appendix: Module description Indonesia, Modul description English for Doctoral Program)

	to complete the module descriptions, making them accessible, in full, to all interested parties.	
11.	Criterion 4.2 Diploma and Diploma Supplement Page 35 However, they point out that the Academic Transcript should also list the ECTS points of each course, not only the awarded CSU.	This point is relevant to BAE, MAE and DAES: We acknowledge the experts' recommendation regarding the inclusion of ECTS points in the Academic Transcript. However, the format and content of the transcript are standardized and centrally managed by UGM, and therefore any changes—such as the addition of ECTS points—would require a university-wide policy decision. Nevertheless, at the program and faculty level, if required, we are able to accommodate this information through the Diploma Supplement, which includes the corresponding ECTS credits for each course.
12.	Criterion 4.2 Diploma and Diploma Supplement Page 35 However, the Diploma Supplement should include the awarded CSU and ECTS points of the respective degree program. For this reasons, the experts expect UGM to correct the	This point is relevant to BAE, MAE and DAES: We appreciate the experts' recommendation regarding the inclusion of both CSU and ECTS points in the Diploma Supplement. Similar to the academic transcript, the format and content of the Diploma Supplement are regulated at the university level to ensure consistency across all study programs. Therefore, any revisions—such as the inclusion of ECTS points—require approval and policy changes from the central university administration. (Appendix: Example of Diploma Supplement, Bachelor, Master, Doctoral) However, we acknowledge the importance of this information and will communicate this recommendation to the relevant authorities at UGM. In the meantime, we will explore possible

	awarded documents and to include all required information.	ways to provide ECTS-related information through additional supporting documents issued at the program or faculty level, if necessary.
13.	Criterion D 1 Research Page 39 However, they request that the research map of the Department of Agricultural and Biosystems Engineering be published on the website to further enhance visibility and engagement among relevant stakeholders.	This point is relevant to BAE, MAE and DAES: We acknowledge the importance of publishing the research map to enhance visibility and stakeholder engagement. In response to the experts' suggestion, we have added the research map of the Department of Agricultural and Biosystems Engineering available on the department's website. (Appendix: Research map on the website)
14.	Criterion D 2 Duration and Credits Page 40 However, there are many Doctoral students, who cannot finish the program in time. As noted in Criterion 1.5, the average length of study is over 5 years. During the audit, the experts identified that the publication requirement poses a	This point is relevant to DAES: We acknowledge that the publication requirement may contribute to delays in doctoral completion. However, this requirement aligns with national and UGM regulations, which mandate at least one international journal publication with the doctoral student as the first author. Recognizing the challenges—such as high rejection rates and long peer-review processes, we have implemented several support mechanisms, including support from UGM, in terms of: 1. Language editing services 2. Workshop in writing and publication 3. Semester-based performance reporting and monitoring via Google Sheet and Research Progress Seminar

significant barrier to the timely completion and expect that measures be implemented to address this challenge.

4. Research and publication incentives tied to manuscript output
5. Financial support for international journal publication and conference participation
(Appendix)

To improve the writing and publication process, we will implement:

1. Journal clinics held at least once per semester at the department level
2. Workshop in scientific writing once per semester

Some examples of the scientific writing workshop:



Several programs are also offered by Universitas Gadjah Mada, for example:

1. Nature Research Academy (<https://wcu.ugm.ac.id/research-and-academic/nature-research-academy-2021/>)

		2. Nature Masterclasses live (https://penelitian.ugm.ac.id/event/nra10/) 3. A Masterclass on Boosting Citations and Overcoming Journal Rejections (https://penelitian.ugm.ac.id/event/enago-2024/) 4. Navigating Scientific Writing (https://penelitian.ugm.ac.id/event/nmo2024-1/)
15.	Criterion D 3 Soft Skills and Mobility Page 41 As highlighted under Criterion 1.3, the experts support this initiative and recommend expanding efforts to further internationalize UGM. This includes establishing more international cooperation and exchange programs, along with offering additional and better-funded scholarships.	This point is relevant to BAE, MAE and DAES: We acknowledge the low participation of doctoral students in international programs, largely due to funding constraints. Nevertheless, to strengthen international exposure and collaboration, our department will implement the following targeted strategies: 1. Increase participation in UGM’s International Joint Supervision scheme by strengthening collaborations with partner universities abroad. (Appendix) 2. Continue and enhance funding support for doctoral students to conduct short-term research stays or present at international conferences. (Appendix) 3. Actively integrate international mobility components into collaborative research proposals (e.g., Riset Kolaborasi Indonesia (RKI)) to fund doctoral student exchanges. (Appendix). 4. Identify and promote scholarships and fellowships that support doctoral mobility, such as through DAAD, ASEA UNINET, Erasmus+, SEARCA, VLIR UOS
16.	Criterion D 5 Infrastructure Page 4.4 As noted under Criterion 3.2, while the experts consider the current equipment and facilities adequate for supporting research	This point is relevant to BAE, MAE and DAES: We acknowledge the findings. Since there is no separation of laboratory facilities for bachelor and graduate students, the measures are the same as written in number 8 above.

	activities, they recommend considering upgrades to meet future needs and evolving requirements.	
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G Summary: Expert recommendations (19.05.2025)

Taking into account the additional information and the comments provided by UGM, the experts summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Program	ASIIN Seal	Maximum duration of accreditation
Bachelor Agricultural Engineering	With requirements for one year	30.09.2030
Master Agricultural Engineering	With requirements for one year	30.09.2030
Doctor Agricultural Engineering	With requirements for one year	30.09.2030

Requirements

For all degree programs:

- A 1. (ASIIN 3.2, D5) Ensure that all laboratories follow international standards with respect to safety measures.

For both the Master's and Doctoral programs:

- A 2. (ASIIN 1.5, D2) Ensure that appropriate support, such as mandatory workshops, seminars or others, is available for students to meet the publication requirement, as this is a significant factor causing delays in graduation.

Recommendations

For all degree programs:

- E 1. (ASIIN 1.3, D3) It is recommended that student academic mobility and international cooperation be further promoted in line with the international aspiration of the programs.
- E 2. (ASIIN 1.3, 3.1) It is recommended to keep on improving the English language skills of students and teaching staff to drive internationalization and student mobility.
- E 3. (ASIIN 3.1) It is recommended that an acceleration program be implemented to support the career development of teaching staff.
- E 4. (ASIIN 3.2, D5) It is recommended to upgrade existing laboratories for teaching and

research to align with future requirements of the programs.

- E 5. (ASIIN 4.2) It is recommended that the Diploma Supplement include the awarded CSU and ECTS points of the respective degree program.

For both the Bachelor's and Master's programs:

- E 6. (ASIIN 1.2) It is recommended to use the title Bachelor/Master of Agricultural Engineering instead of Bachelor of Agricultural Technology/Master of Science, as it more accurately reflects the program's objectives, learning outcomes, and curriculum.

For both the Master's and Doctoral programs:

- E 7. (ASIIN 1.1) It is recommended to establish a clear structure to support the entrepreneurship skills of the students.

H Comments of the Technical Committees

Technical Committee 08 – Agriculture, Forestry and Food Sciences (03.06.2025)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the requirements and recommendations proposed by the expert group, which are accepted by the Technical Committee without making any changes.

The Technical Committee 08 – Agriculture, Forestry and Food Sciences recommends the award of the seals as follows:

Degree Program	ASIIN Seal	Maximum duration of accreditation
Bachelor Agricultural Engineering	With requirements for one year	30.09.2030
Master Agricultural Engineering	With requirements for one year	30.09.2030
Doctor Agricultural Engineering	With requirements for one year	30.09.2030

Technical Committee 01 – Mechanical Engineering/Process Engineering (05.06.2025)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows largely the assessment of the auditors. However, it is of the opinion that the indication of ECTS credits for the entire scope of the programme in the Diploma Supplement is necessary. It therefore proposes converting the corresponding recommendation into a requirement.

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

Degree Program	ASIIN Seal	Maximum duration of accreditation
Bachelor Agricultural Engineering	With requirements for one year	30.09.2030
Master Agricultural Engineering	With requirements for one year	30.09.2030
Doctor Agricultural Engineering	With requirements for one year	30.09.2030

Requirements

For all degree programs:

- A 1. (ASIIN 3.2, D5) Ensure that all laboratories follow international standards with respect to safety measures.
- A 2. (ASIIN 4.2) Ensure that the Diploma Supplement includes the awarded CSU and ECTS points of the respective degree program.

For both the Master's and Doctoral programs:

- A 3. (ASIIN 1.5, D2) Ensure that appropriate support, such as mandatory workshops, seminars or others, is available for students to meet the publication requirement, as this is a significant factor causing delays in graduation.

Recommendations

For all degree programs:

- E 1. (ASIIN 1.3, D3) It is recommended that student academic mobility and international cooperation be further promoted in line with the international aspiration of the programs.
- E 2. (ASIIN 1.3, 3.1) It is recommended to keep on improving the English language skills of students and teaching staff to drive internationalization and student mobility.
- E 3. (ASIIN 3.1) It is recommended that an acceleration program be implemented to support the career development of teaching staff.
- E 4. (ASIIN 3.2, D5) It is recommended to upgrade existing laboratories for teaching and research to align with future requirements of the programs.

For both the Bachelor's and Master's programs:

- E 5. (ASIIN 1.2) It is recommended to use the title Bachelor/Master of Agricultural

Engineering instead of Bachelor of Agricultural Technology/Master of Science, as it more accurately reflects the program's objectives, learning outcomes, and curriculum.

For both the Master's and Doctoral programs:

- E 6. (ASIIN 1.1) It is recommended to establish a clear structure to support the entrepreneurship skills of the students.

I Decision of the Accreditation Commission (27.06.2025)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the procedure and follows the assessment of the Technical Committee 01 – Mechanical Engineering/Process Engineering regarding Requirement A2 without further changes.

The Accreditation Commission decides to award the following seals:

Degree Program	ASIIN Seal	Maximum duration of accreditation
Bachelor Agricultural Engineering	With requirements for one year	30.09.2030
Master Agricultural Engineering	With requirements for one year	30.09.2030
Doctor Agricultural Engineering	With requirements for one year	30.09.2030

Requirements

For all degree programs:

- A 1. (ASIIN 3.2, D5) Ensure that all laboratories follow international standards with respect to safety measures.
- A 2. (ASIIN 4.2) Ensure that the Diploma Supplement includes the awarded CSU and ECTS points of the respective degree program.

For both the Master's and Doctoral programs:

- A 3. (ASIIN 1.5, D2) Ensure that appropriate support, such as mandatory workshops, seminars or others, is available for students to meet the publication requirement, as this is a significant factor causing delays in graduation.

Recommendations

For all degree programs:

- E 1. (ASIIN 1.3, D3) It is recommended that student academic mobility and international

cooperation be further promoted in line with the international aspiration of the programs.

- E 2. (ASIIN 1.3, 3.1) It is recommended to keep on improving the English language skills of students and teaching staff to drive internationalization and student mobility.
- E 3. (ASIIN 3.1) It is recommended that an acceleration program be implemented to support the career development of teaching staff.
- E 4. (ASIIN 3.2, D5) It is recommended to upgrade existing laboratories for teaching and research to align with future requirements of the programs.

For both the Bachelor's and Master's programs:

- E 5. (ASIIN 1.2) It is recommended to use the title Bachelor/Master of Agricultural Engineering instead of Bachelor of Agricultural Technology/Master of Science, as it more accurately reflects the program's objectives, learning outcomes, and curriculum.

For both the Master's and Doctoral programs:

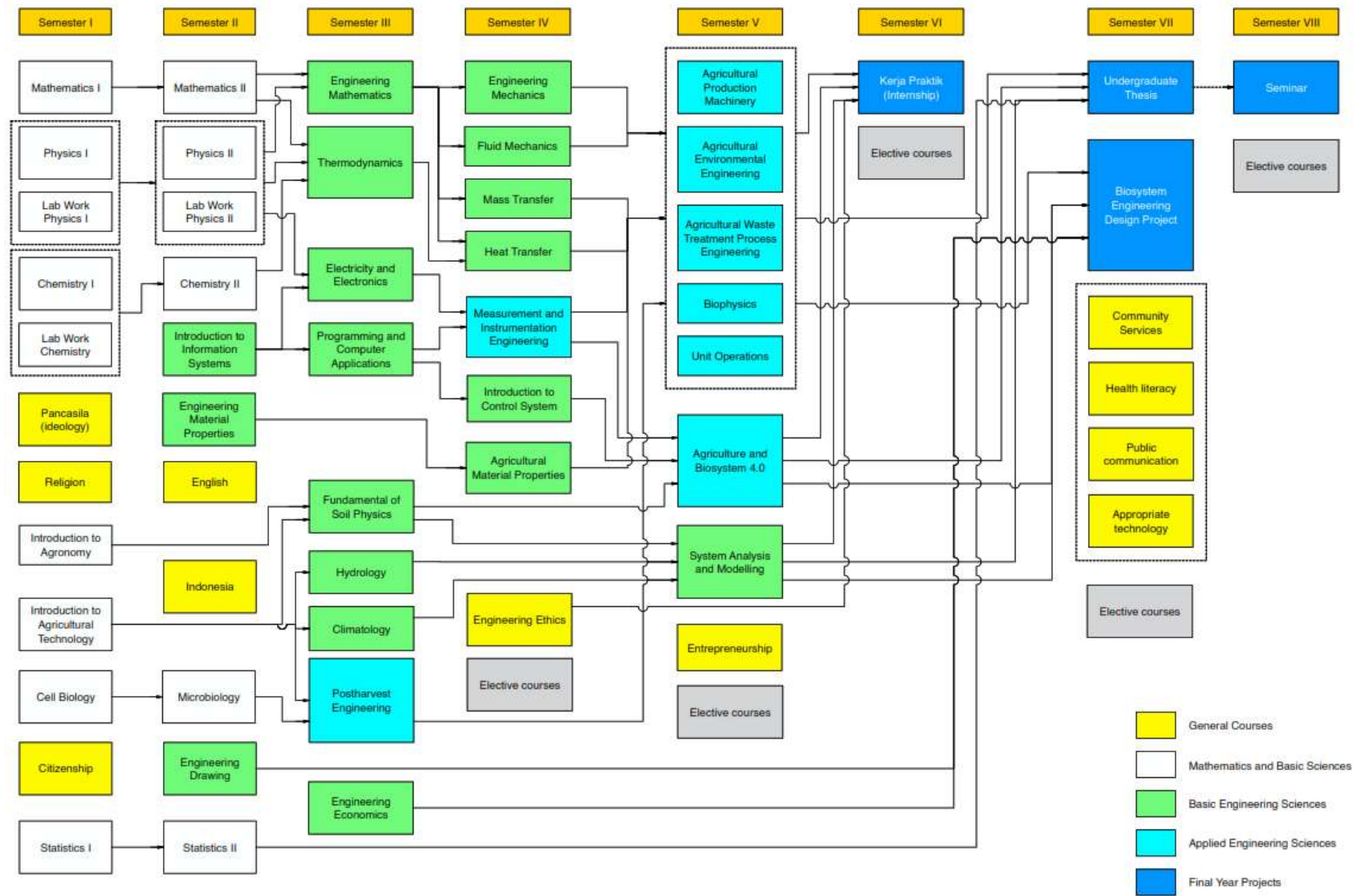
- E 6. (ASIIN 1.1) It is recommended to establish a clear structure to support the entrepreneurship skills of the students.

Appendix: Program Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree program Agricultural Engineering:

PROGRAM LEARNING OUTCOMES	
LO1	Able to apply knowledge of mathematics, natural and/or materials science, information technology and engineering in biosystems (PO1, C)
LO2	Able to design components, systems and/or processes to meet the expected needs within the boundaries of sustainable agroindustry and to recognize and/or utilize the potential of local and national resources with a global outlook (PO1, PO3, C, M)
LO3	Able to design and carry out laboratory and/or field experiments, analyze and interpret data, and use technical justification to draw conclusions (PO1, C, M)
LO4	Able to identify, formulate, analyze, and solve agricultural engineering and biosystem problems (PO1, C)
LO5	Able to apply methods, skills and modern engineering tools required for engineering practice (PO1, M)
LO6	Able to communicate effectively both orally and in writing (PO1, A)
LO7	Able to plan, complete and evaluate tasks within the limits of sustainable agroindustry (PO1, PO2, PO3, C)
LO8	Able to work in cross-disciplinary and cross-cultural teams (PO1, PO3, A)
LO9	Able to be responsible to the community and comply with professional ethics in solving technical problems to support sustainable agroindustry (PO1, PO2, A)
LO10	Able to understand the need for lifelong learning, including access to knowledge related to current and relevant issues (PO1, PO2, PO3, C, A)
LO11	Able to understand and apply data and technology literacy in the agroindustry sector (PO1, PO2, PO3, C, M)

(PO=Program Objective, C=cognitive, M=motoric, and A=affective)



The following curriculum is presented:

No.	Code	Courses	Credits		Status C/E
			Class	Lab.	
Semester 1					
1	TPPB211101	Mathematics I	2		C
2	TPPB211102	Physics I	2		C
3	TPPB211103	Lab Work Physics I		1	C
4	TPPB211104	Chemistry I	2		C
5	TPPB211105	Lab Work Chemistry I		1	C
6	TPPB211106	Cell Biology	2	1	C
7	TPPB211107	Statistics I	2		C
8	TPPB211108	Introduction to Agronomy	2	1	C
9	TPUN211109	The ideology of the Republic of Indonesia	2		C
10	TPTP211110	Introduction to Agricultural Technology	2		C
11	TPUN211111	Islam Religion	2		C
12	TPUN211112	Catholicism Religion	2		C
13	TPUN211113	Protestantism Religion	2		C
14	TPUN211114	Hinduism Religion	2		C
15	TPUN211115	Buddhism Religion	2		C
16	TPUN211116	Confucianism Religion	2		C
17	TPUN211117	Citizenship Education	2		C
Subtotal			20	4	
Semester 2					
1	TPPB211201	Mathematics II	2		C
2	TPPB211202	Physics II	2		C
3	TPPB211203	Lab Work Physics II		1	C
4	TPPB211204	Chemistry II	2		C
5	TPPB211205	Statistics II	2		C
6	TPPB211206	Introduction to Information Systems	2		C
7	TPPB211207	Microbiology	2		C
8	TPPB211208	Engineering Drawing	1	2	C
9	TPPB211209	English	2		C
10	TPPB211210	Indonesian	2		C
11	TPPB211211	Engineering Material Properties	2	1	C
Subtotal			19	4	

Semester 3					
1	TPPB212101	Engineering Mathematics	3		C
2	TPPB212102	Thermodynamics	2		C
3	TPPB212103	Electricity and Electronics	2	1	C
4	TPPB212104	Fundamental of Soil Physics	2	1	C
5	TPPB212105	Climatology	2	1	C
6	TPPB212106	Programming and Computer Applications	2	1	C
7	TPPB212107	Engineering Economics	2		C
8	TPPB212108	Postharvest Engineering	2	1	C
9	TPPB212109	Hydrology	2		C
Subtotal			19	5	
Semester 4					
1	TPPB212201	Engineering Mechanics	3		C
2	TPPB212202	Fluid Mechanics	2		C
3	TPPB212203	Heat Transfer	3		C
4	TPPB212204	Mass Transfer	2		C
5	TPPB212205	Introduction to Control System	2	1	C
6	TPPB212206	Measurement and Instrumentation Engineering	2	1	C
7	TPPB212207	Engineering Ethics	1		C
8	TPPB212208	Agricultural Material Properties	2	1	C
9	TPPB212209	Farm Power	2	1	E
10	TPPB212210	Ergonomics	2		E
11	TPPB212211	Surveying	2	1	E
12	TPPB212212	Land Resources Engineering and Management in Tropics	2		E
13	TPPB212213	Biomass Cultivation Engineering	2		E
14	TPPB212214	Agroclimatology	2		E
15	TPPB212215	Industrial Sanitation Engineering	2		E
16	TPPB212216	Storage and Packaging Engineering	2		E
Subtotal			33	5	

Semester 5					
1	TPPB213101	Agricultural Production Machinery	2	1	C
2	TPPB213102	System Analysis and Modelling	2		C
3	TPPB213103	Agricultural Environmental Engineering	2	1	C
4	TPPB213104	Unit Operations	2	1	C
5	TPPB213105	Entrepreneurship	2		C
6	TPPB213106	Agriculture and Biosystem 4.0	2		C
7	TPPB213107	Agricultural Waste Treatment Process Engineering	2	1	C
8	TPPB213108	Biophysics	2	1	C
9	TPPB213109	Biosystem Machinery Design	2		E
10	TPPB213110	Mechatronics and Robotic Biosystems	2	1	E
11	TPPB213111	Pneumatic and Hydraulic Systems	2		E
12	TPPB213112	Non-destructive Evaluation Technology	2		E
13	TPPB213113	Principles of Irrigation Engineering	2	1	E
14	TPPB213114	Soil and Water Conservation Engineering	2	1	E
15	TPPB213115	Watershed Engineering and Management	2		E
16	TPPB213116	Disaster Risk Reduction in Agriculture	2		E
17	TPPB213117	Biomaterial Process Engineering	2	1	E
18	TPPB213118	Environmental Chemistry	2	1	E
19	TPPB213119	Environmental Physics	2	1	E
20	TPPB213120	Food Process Engineering	2	1	E
21	TPPB213121	Drying Engineering	2		E
22	TPPB213122	Refrigeration and Freezing Engineering	2		E
23	TPPB213123	Food Material Science	2		E
Subtotal			46	12	

Semester 6					
1	TPPB213201	Internship		2	C
2	TPPB213202	Biosystem Machinery Constructions	2	1	E
3	TPPB213203	Bioenergy Engineering	2	1	E
4	TPPB213204	Irrigation Management	2		E
5	TPPB213205	Geographic Information System in Agriculture	2	1	E
6	TPPB213206	Heating, Ventilation, dan Air Conditioning Facilities Design	2		E
7	TPPB213207	Air Pollution Control and Management	2	1	E
8	TPPB213208	Environment and Waste Management	2		E
9	TPPB213209	Bioprocess Engineering	2		E
10	TPPB213210	Food Material Quality Evaluation	2		E
11	TPPB213211	Design Process and Equipment of Food Industry	2		E
12	TPPB213212	Beverage and Confectionery Engineering	2		E
13	TPPB213213	Recent Topics	2		E
14	TPPB213214	Internship 1		8	E
15	TPPB213215	Internship 2		10	E
16	TPPB213216	Internship 3		2	E
Subtotal			24	26	
Semester 7					
1	TPPB214101	Thesis		4	C
2	TPPB214102	Biosystem Engineering Design Project		4	C
3	TPUN214103	Community Services		3	C
4	TPPB214104	Research 1		5	E
5	TPPB214105	Research 2		10	E
6	TPPB214106	Entrepreneur 1		8	E
7	TPPB214107	Entrepreneur 2		12	E
8	TPPB214108	Independent Project 1		4	E
9	TPPB214109	Independent Project 2		12	E
10	TPPB214110	Community Development 1		8	E
11	TPPB214111	Community Development 2		12	E
12	TPPB214112	Humanity Project 1		8	E
13	TPPB214113	Humanity Project 2		12	E

14	TPPB214114	Teaching for Community 1		8	E
15	TPPB214115	Teaching for Community 2		12	E
16	TPPB214116	Special Topic 1	2		E
17	TPPB214117	Special Topic 2	2		E
18	TPPB214118	Special Topic 3	2		E
19	TPPB214119	Special Topic 4	3		E
20	TPPB214120	Special Topic 5	3		E
21	TPPB214121	Special Topic 6	4		E
22	TPPB214122	Special Topic 7	4		E
Subtotal			20	122	
Semester 8					
1	TPPB214201	Seminar		1	C
Subtotal			0	1	

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree program Agricultural Engineering:

PROGRAM LEARNING OUTCOMES	
LO1	Able to develop the principles of agricultural and biosystems engineering to identify, understand, explain, evaluate, and analyze related problems by scientific methods and approaches, and solve the problems through engineering design, construction, equipment testing, as well as natural resource management and production processes with inter and or multidisciplinary approaches (PO1, PO2, C, M)
LO2	Able to develop science and technology through research, manage research activities, and disseminate the research results at national and international levels (PO1, PO2, M, A)
LO3	Able to master engineering, research methodology, and mathematical analysis for supporting the important role as professionals, researchers, and developers of science and technology in the field of agricultural and biosystems engineering (PO1, PO2, PO3, C, M)
LO4	Able to act and behave professionally and innovatively in work and career for comprehensive scientific development in accordance to engineering ethics and social norms, and effective scientific communication as active response to the development of science and technology (PO2, A)
LO5	Able to have leadership and decision-making skills by considering and based on engineering principles and management systems in the field of agricultural and biosystems engineering (PO1, PO3, PO4, C, A)
LO6	Able to master and apply principles of engineering design and management systems as basic considerations for decision-making and development of competitive technology based on local excellence of raw materials, wisdom, and technology in sustainable systems of tropical agricultural industries and environmentally friendly manner (PO1, PO3, PO4, C)

(PO=Program Objective, C=cognitive, M=motoric, and A=affective)

The following curriculum is presented:

No	Code	Courses	Credits	Semester
Compulsory Courses (Regular)				
1	TPPB215001	Research Methodology	2	Odd/Even
2	TPPB215002	Biosystem Engineering	3	Odd/Even
3	TPPB215003	Engineering Analysis Methods	2	Odd/Even
4	TPPB215101	Special Topics	2	Odd
5	TPPB215201	Modeling and Simulation Engineering	3	Even
6	TPPB215202	Industrial Agricultural Management System	3	Even
7	TPPB215203	Process Design and Manufacturing System	2	Even
8	TPPB215204	Advanced Mathematic Engineering	3	Even
9	TPPB216001	Thesis	12	Odd/Even

Compulsory Courses (by Research)				
1	TPPB215001	Research Methodology	2	Odd/Even
2	TPPB215002	Biosystem Engineering	3	Odd/Even
3	TPPB215003	Engineering Analysis Methods	2	Odd/Even
4	TPPB215004	Thesis	30	Odd/Even
Elective Courses				
1	TPPB215102	Geographic Information System Applications	2	Odd
2	TPPB215103	Soil Physics	2	Odd
3	TPPB215104	Irrigation Engineering and Management	2	Odd
4	TPPB215105	Energy Conversion and Conservation Engineering	2	Odd
5	TPPB215106	Management of Mechanized Farming Systems	2	Odd
6	TPPB215107	Soil Mechanics	2	Odd
7	TPPB215108	Agricultural Product Processing Engineering	2	Odd
8	TPPB215109	Advanced Packaging and Storage Engineering	2	Odd
9	TPPB215110	Advanced Heat and Mass Transfer	2	Odd
10	TPPB215111	Advanced Agricultural Buildings Environmental Engineering	2	Odd
11	TPPB215112	Advanced Agricultural Land Environmental Engineering	2	Odd
12	TPPB215113	Advanced Biopolymer Process Engineering	2	Odd
13	TPPB215205	Water Resources Development and Management	2	Even
14	TPPB215206	Environmental Climatology and Hydrology	2	Even
15	TPPB215207	Agricultural Machinery Design and Testing	2	Even
16	TPPB215208	Control Systems and Sensors	2	Even
17	TPPB215209	Drying and Cooling Engineering	2	Even
18	TPPB215210	Postharvest Physiology	2	Even
19	TPPB215211	Air Conditioning and Refrigeration Engineering	2	Even
20	TPPB215212	Advanced Agricultural Waste Treatment Process Engineering	2	Even

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Doctoral program Agricultural Engineering:

PROGRAM LEARNING OUTCOMES	
LO1	To master the philosophy, theoretical concepts, and application of science and engineering in the field of agricultural and biosystems engineering (PO1, C)
LO2	To be able to develop science and engineering concepts, formulate policies in solving agricultural and biosystem engineering problems, and produce creative, innovative, and valid works beneficial for the mankind (PO1, PO3, C)
LO3	To be able to deepen or expand science in agricultural and biosystem engineering through independent research that is original, novel, and prominent using inter, multi and transdisciplinary approaches (PO2, PO3, M)
LO4	To be able to produce and disseminate international reputation scientific works by implementing academic integrity (PO2, A)

(PO=Program Objective, C=cognitive, M=motoric, and A=affective)

The following curriculum is presented:

No	Code	Course Name	Credit	Semester
Compulsory Courses				
1.	TPPB217001	Philosophy of Science and Dissertation Studies	2	Odd/Even
2.	TPPB217002	Comprehensive Study in Agricultural Engineering	2	Odd/Even
3.	TPPB217003	Special Topics	1	Odd/Even
4.	TPPB219001	Dissertation (regular)	34	Odd/Even
5.	TPPB219002	Dissertation (by research)	38	Odd/Even
Elective Courses				
1.	TPPB218001	Mathematical Analysis	2	Odd/Even
2.	TPPB218002	Communication of Research Results	2	Odd/Even
3.	TPPB218003	Bioenergy Engineering	2	Odd/Even
4.	TPPB218004	Bioproduction Machinery Engineering	2	Odd/Even
5.	TPPB218005	Bioinformatics Management Systems	2	Odd/Even
6.	TPPB218006	Biosensing and Robotics Engineering	2	Odd/Even
7.	TPPB218007	Advanced Irrigation	2	Odd/Even
8.	TPPB218008	Soil Dynamics	2	Odd/Even
9.	TPPB218009	Hidroklimatologi lanjut Advanced Hydroclimatology	2	Odd/Even
10.	TPPB218010	Soil and Water Conservation Techniques for Sustainable Agriculture	2	Odd/Even
11.	TPPB218011	Food Product Engineering	2	Odd/Even
12.	TPPB218012	Fenomena Transport	2	Odd/Even
13.	TPPB218013	Food Preservation Engineering	2	Odd/Even
14.	TPPB218014	Environmental Bioprocessing Engineering	2	Odd/Even

15.	TPPB218015	Advanced Postharvest Techniques	2	Odd/Even
16.	TPPB218016	Agricultural Environmental Management and Policy	2	Odd/Even
17.	TPPB218017	Agricultural Environmental Pollution Control and Restoration	2	Odd/Even
18.	TPPB218018	Agricultural Land Planning and Management	2	Odd/Even