



ASIIN Seal & EUR-ACE

Accreditation Report

Bachelor's Degree Programme
Agricultural and Biosystems Engineering (previously:
Agricultural Engineering)
Bioprocess Engineering
Animal Science

Provided by
Universitas Brawijaya, Malang (Indonesia)

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A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for ¹	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) ²
Sarjana Teknik Pertanian dan Biosistem	Bachelor of Agricultural and Biosystems Engineering	ASIIN, EUR-ACE® Label	National Accreditation (BAN PT) 27.12.2017 27.12.2022	TC 01, TC 08
Sarjana Teknik Bioproses	Bachelor of Bioprocess Engineering	ASIIN, EUR-ACE® Label	National Accreditation (BAN PT) 02.05.2017 02.05.2022	TC 01, TC 10
Sarjana Peternakan	Bachelor of Animal Science	ASIIN	National Accreditation (BAN PT) 10.12.2015 09.12.2020	TC 08
<p>Date of the contract: 23.07.2020</p> <p>Submission of the final version of the self-assessment report: 01.09.2021</p> <p>Date of the onsite visit: 25.-27.10.2021</p> <p>at: online audit</p>				
<p>Peer panel:</p> <p>Prof. Dr.-Ing. Burkhard Egerer, Nuremburg Institut of Technology Georg Simon Ohm</p> <p>Prof. Dr.-Ing. Peter Schulze Lammers, University of Bonn</p>				

¹ ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes

² TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering; TC 08 - Agriculture, Nutritional Sciences and Landscape Architecture; TC 10 - Life Sciences.

A About the Accreditation Process

Prof. Dr. Asmuddin Natsir, Hasanuddin University Agung Triatmojo, Student at Gadjah Mada University	
Representatives of the ASIIN headquarter: Christin Habermann	
Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering/Process Engineering as of December 9, 2011; Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture as of March 27, 2015 as well as TC 10 – Life Sciences as of June 28, 2019.	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF ³	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Agricultural and Biosystems Engineering	Sarjana Teknik (ST) Bachelor of Engineering (B.Eng.)	/	6	Full time	/	8 Semesters	144 CP 244.80 ECTS	August each year, Since 1975
Bioprocess Engineering	Sarjana Teknik (ST) Bachelor of Engineering (B.Eng.)	/	6	Full time	/	8 Semesters	144 CP 244.80 ECTS	August each year, Since 2014
Animal Science	Sarjana Sains (S. Pt.) Bachelor of Animal Science (B.An.Sc.)	/	6	Full time	/	8 Semesters	144 CP 244.80 ECTS	August each year, Since 1961

For the Bachelor's degree programme Agricultural and Biosystems Engineering the institution has presented the following profile in the academic handbook:

“This study program focuses on the application of production technology, utilization of agricultural products and materials, and natural energy by focusing on the formal object of engineering in the procurement of machinery, buildings and environmental control, and agricultural production systems and agricultural product processing.

The specifications of the science provided cover the basic agricultural engineering applications, the operation, the maintenance of agricultural equipment and machinery, the managerial skills to organize, develop and implement the new technologies, long-term and strategic planning of agricultural engineering aspects, agricultural engineering research, and development, design of agricultural engineering. Moreover, it scopes training and career development, installation, construction and manufacturing, security, reliability, work safety, and aspects of mechanization of material and agricultural product handling and marketing.”

³ EQF = The European Qualifications Framework for lifelong learning

For the Bachelor's degree programme Bioprocess Engineering the institution has presented the following profile in the academic handbook:

"We are preparing our graduates for their career and professional life, and within a few years of graduation, as follows:

1. Graduates acquire professional leadership roles in bioprocess engineering and related fields leading to successful careers.
2. Graduates establish commitment and contribute towards sustainable and bio-based economy development for a better society
3. Graduates engage in lifelong learning in conducting practical engineer tasks."

For the Bachelor's degree programme Animal Science the institution has presented the following profile in the academic handbook:

"Vision: To become a leading institution in the animal science sector based on local resources at the national and international level.

Mission:

1. Providing education in the sector of animal science that fulfils national and international standards.
2. Developing research that produces international standard scientific work as well as science and technology that is needed for society and industry.
3. Developing and expanding the cooperation networks both domestic and abroad in the sectors of education, research and international scientific publications.
4. Aligning the quality of learning with national and international standards to produce graduates who are competitive nationally and internationally and have competencies according to the needs of stakeholders."

C Peer Report for the ASIIN Seal⁴

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Webpage of all study programmes
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors base their assessment of the learning outcomes as provided on the websites and in the Self-Assessment Reports of the three Bachelor's degree programmes under review.

The auditors refer to the Subject-Specific Criteria (SSC) of the respective Technical Committees (TC) as a basis for judging whether the intended learning outcomes of the Bachelor's programmes as defined by UB correspond with the competences as outlined by the SSC. For the Bachelor's degree programme Agricultural and Biosystems Engineering they refer to the SSC of the TC Agriculture and the TC Mechanical Engineering and Process Engineering. For the Bachelor's degree programme Bioprocess Engineering they refer to the SSC of the TC Mechanical Engineering and Process Engineering and for the Bachelor's degree programme Animal Science they refer to the SSC of the TC Agriculture and the TC Life Science. They come to the following conclusions:

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

Graduates of the Bachelor's degree programme Agricultural and Biosystems Engineering (BAE) should have an ability to use engineering principles in designing technology products related to the field of agricultural engineering science and be able to manage and utilize natural resources (agricultural and environmental) and supporting resources, such as human resources or infrastructure, in an optimal and sustainable way. In addition, they should foster an attitude of creative and innovate thinking, professional behaviour as well as strong leadership skills that allows them to communicate effectively in the scientific community. Furthermore, graduates should be capable to identify, formulate, analyse and solve problems in the field of agricultural engineering through systems approach, conduct research, explore, develop and apply science and technology in their chosen field as well as hold the ability to develop and manage entrepreneurial skills oriented towards the field of agribusiness and agroindustry.

Graduates of the Bachelor's degree programme Bioprocess Engineering (BBE) should have acquired sound knowledge in mathematics and natural sciences in order to apply engineering principles to determine and solve contemporary and complex problems relating to bioprocessing. They should be able to formulate and operate conversion processes of biological resources into bio-based value-added materials related to food, feed, fuels, pharmaceuticals, nutraceuticals, biomaterials or biochemicals. They have learned how to design biological reaction and reactors including their materials, instrumentation, control and modelling and are able to conduct practice-based tasks related to bioprocessing in a responsible, safe, voluntary, self-motivated and ethical manner. In addition, graduates should be able to communicate creative ideas and work effectively within professional communities and the larger society, demonstrate an ability to work in multidisciplinary and multicultural teams. Finally, they are capable of appraising bioprocessing and bioproduct manufacturing and valorisation using entrepreneurship principles.

Graduates of the Bachelor's degree programme Animal Science (BAS) are capable to develop knowledge and a comprehensive mindset based on animal science and industry. They have learned to analyse the development and implementation of technology through humanities, ethical and scientific value as to provide appropriate solutions and ideas. In addition, graduates are proficient in the areas of biology, physiology, animal nutrition, breeding and farm management. They hold the skills to ethically design and perform experiments, analyse and interpret data in order to find sustainable solutions to current problems in the field of Animal Science. They are also able to implement technology in the field of Animal Science to increase productivity, efficiency, quality and sustainability based on breeding, nutrition, processing, and management.

In addition to the subject-related qualification objectives, students of all three Bachelor's programmes should be capable of working autonomously as well as in a team-oriented manner, and be able to conduct research activities. Furthermore, they are able to solve subject-relevant problems, can present their results, have trained their analytical and logical abilities, and have an awareness of possible social and ethical effects of their actions. During the course of their studies, the students have acquired communicative and language skills, and have developed a strategy for life-long learning.

The auditors hold the view that the objectives and intended learning outcomes of all three degree programmes under review are reasonable and well founded. They learn that various stakeholders (alumni, industrial and governmental representatives) are involved in the constant review and development of the curricula. For example, industrial representatives are regularly invited to give suggestions on the skills and expertise graduates must possess and which new materials or topics should be added to the curricula. While there exists a national standard for designing the curriculum, especially the elective modules allow Universitas Brawijaya (UB) to adapt to the suggestions from their stakeholders.

In summary, the auditors are convinced that the intended qualification profiles of the three undergraduate programmes under review allow students to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the goals set for them. The objectives and intended learning outcomes of all three degree programmes under review are reasonable and well founded.

The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 01 – Mechanical Engineering (BAE and BBE), the SSC of the Technical Committee 08 – Agriculture (BAE, BAS) and the SSC of the Technical Committee 10 – Life Sciences (BAS).

Criterion 1.2 Name of the degree programme

Evidence:

- Academic Handbook
- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors confirm that the English translation and the original Indonesian names of all degree programmes under review correspond with the intended aims and learning outcomes as well as the main course language (Indonesian). They ask, why the name of the BAE programme has been changed from Bachelor of Agricultural Engineering to Bachelor of Agriculture and Biosystems Engineering and learn that this has been a demand by the government which UB, as a state university, had to oblige.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Webpages of all study programmes
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The Agricultural and Biosystems Engineering as well as the Bioprocess Engineering undergraduate programmes are offered by the Faculty of Agricultural Technology, while the Animal Science programme is offered by the Faculty of Animal Science.

All three Bachelor's degree programmes under review are designed for four years and at least 144 credit semester units (SKS) need to be achieved by the students (this is equivalent to approximately 244.8 ECTS).

All undergraduate programmes at UB are designed to be completed in eight semesters or four academic years with a maximum of 14 semesters or seven academic years. Each semester is equivalent to 16 weeks of learning activities including one week for midterm exams and one week for final exams. The odd semester starts in August and ends January of the following year, while the even semester lasts from February to July. In addition, there is an optional summer semester, which is designed for students, who need to make up on missed or failed courses.

The curriculum consists of university requirements and compulsory and elective courses determined by UB and the respective departments. University requirements are courses that need to be attended by all undergraduate students at UB. There are seven university requirements: English, Bahasa Indonesia, Religious Education, Civic Education, Entrepreneurship, Pancasila, and Community Service. These courses are almost all offered in the

first two semesters of studies, in addition to courses conveying basic knowledge of natural sciences and mathematics.

Courses on the different subject-specific educational sciences are offered from third to eighth semester. Elective courses can be taken from the third year of study. Students usually choose elective courses that relate to their thesis and/or their individual interests. During the eight semesters, students must also complete the undergraduate thesis (6 SKS) and the community service (3 SKS).

Usually during the last year of studies, students must complete the community service. The peers discuss with the programme coordinators about the content and goal of this course. The programme coordinators explain that community service is compulsory for all Indonesian students. It has a minimum length of four weeks and often takes place in villages or rural areas where students stay and live together with the local people. The course is designed "to allow students to apply their knowledge based on their field in order to empower society." Since the community service usually takes place in remote areas, the students cannot attend any classes during this time. The students work in interdisciplinary teams during the community service in order to advance the society and bring further development about. This course was introduced at all Indonesian Universities in 1971. The assessment of the community service consists of a work plan, programme implementation, and activity report. The peers understand that students should work for the benefit of the community and the Indonesian society during the community service and support this concept.

Regular students take 18 credits in every semester, while outstanding students may take up to 24 credits. Therefore, outstanding students are enabled to complete the Bachelor's degree in less than 4 years. However, this case is rare since the workload of the undergraduate programmes is rather high anyway and designed for a four-year study programme.

Since UB has the goal to become internationally more visible and wants to further internationalising its degree programmes, the peers discuss with the programme coordinators and students if any classes in the three degree programmes are taught in English. The programme coordinators explain that usually all courses are delivered in Bahasa Indonesia (Indonesian language) but most of the teaching materials (teaching slides) are provided in English. Sometimes parts of a lecture are held in English, for example if there is an international guest lecturer. Sometimes, even the whole course is offered in English in order for international student to attend the classes. Information about the curriculum is available for students in the digital academic information system and on the programme's homepage. The students confirm that some presentations are done in English, and English textbooks are used. However, students should be encouraged to actively speaking English. This

could be achieved e.g. by discussing international papers or giving oral presentations in English.

The members of the teaching staff explain that they offer possible topics for the final projects according to their own research projects. All members of the teaching staff supervise theses. Students have to design a research proposal with a time schedule for the project, which is discussed with the academic advisor. If they agree, the students apply formally for being allowed to work on the suggested topic.

The peers gain the impression that the graduates of the all degree programme under review are well prepared for entering the labour market and can find adequate jobs in Indonesia. During the discussion with the peers UB's partner from the industry/public sector confirm that the graduates have a broad scientific education, are very adaptable, and have manifold competences, which allows them to find adequate jobs. The auditors are generally very satisfied with the curricula of all three study programmes; yet for the BAE and the BAS programme they recommend extending courses on digital technologies such as data processing and data mining, to prepare the students even better for their future career.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Decree of Minister of Research, Technology and Higher Education No. 2, 2015
- UB webpage: <https://www.ub.ac.id/admission>
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the Self-Assessment Reports, admission procedures and policies for new students follow the National Regulation No.2, 2015. The requirements, schedule, registration venue, and selection test are announced on UB's webpage and thus accessible for all stakeholders.

There are three different ways by which students can be admitted to a Bachelor's programme at UB:

1. National Entrance Selection of State Universities (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), a national admission system, which is based on the academic performance during the high school (30 % of the students at UB are admitted through this

selection system).

2. Joint Entrance Selection of State Universities (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide written test (subjects: mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography). It accounts for 40 % of the admitted students at UB.

3. Independent Selection (Seleksi Mandiri) students are selected based on a written test (similar to SBMPTN) specifically held by UB for prospective students that haven't been accepted through SNMPTN or SBMPTN (30 % of the students at UB are admitted through this test).

For undergraduate students from the routes of SNMPTN or SBMPTN (via national selection exams), the maximum tuition fee, depending on each programme, is Rp 5,800,000 (~EUR 357.34) per semester. For undergraduate students from the routes of independent selection (Seleksi Mandiri), the tuition fee is slightly higher.

Approximately 15 % of all undergraduate students at UB are fully funded by the government including their daily expenditures. A tuition waiver scheme is available upon request and the amount depends on the parents' economic status. The amount of waiver ranges from 20 to 100 % of the total fee.

The peers ask about the intake rate for each programme and learn that each semester, 180 new students begin the BAE programme, 120 the BBE programme and around 700 new students are enrolled every semester in the BAS programme. The difference in intake between the three programmes is justified by the different faculties: the Animal Science faculty only consists of the study programme BAS, while the faculty of Agricultural Engineering holds six undergraduate programmes in total. In general though, the rate of new students is predetermined by the amount of lecturers and the capacity of the laboratories.

The peers inquire of the programme coordinators why there are so many students applying for studying at UB. They learn that animal science, agricultural engineering and bioprocess engineering are popular subjects because the job perspectives are very good. In addition, there are many high school graduates in Indonesia and UB is one of the most prestigious universities in the country. Consequently, UB only accepts the very best candidates. From their discussion with the students, the peers gain the impression that the admission system is very effective and only very motivated and high-performing candidates are admitted. The peers consider the highly selected and motivated students to be one of the strong points of the three undergraduate programmes under review.

In summary, the auditors find the terms of admission to be binding and transparent. They

confirm that the admission requirements support the students in achieving the intended learning outcomes.

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

Regarding Criterion 1.3 – Extending courses on digital technology

In their statement, the university writes that all three study programs, including Bachelor's degree programme Bioprocess Engineering (BBE), actually have courses that cover data processing and data mining as suggested. An introduction to digital technology, data processing, and data mining has been included in the course modules of BAE and BBE. Topics on electronics and instrumentation are part of the Environmental Measurement and Computer Application course modules in BAE and the Automatization 1 module in BBE, which also discusses topics of digital technology. The topic of data science has been introduced in the BBE course module Modeling and Optimization of Biological System since 2021. For BAE, a new course module will be created, i.e., Data Science in Agriculture as an elective course module. The reconstruction of the BAS Curricula in 2020 included the Animal Science Engineering course module, which accommodates student competencies related to digital technology in the livestock major. In addition, other course modules that compose the BAS Curricula contain data processing technology topics, i.e., Ration Formulation, Poultry Industry, Dairy Industry, Beef Cattle Industry, Livestock Industry System, and Animal Breeding. For the short term, digital technologies and related topics will be included in existing course modules, and a new course module will be created specifically after the next curriculum workshop meeting. The auditors are very happy with the explanation given by UB and believe that the university will increase the great work already done in the future.

In summary, the auditors deem criterion 1 to be fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules
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Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes

- Module descriptions
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The curriculum of all three Bachelor’s degree programmes under review are designed for eight semesters. Nevertheless, it also possible for excellent students to complete the degree in only seven semesters. Students cannot cover more than 24 SKS per semester. The students’ individual study plans are different from each other, but have to be approved by their academic advisors and the Vice Dean of Academic and Student Affairs. The curricula include theoretical and practical courses, thesis and thesis proposal, community service, and electives.

Elective courses can be chosen by the students in accordance with their areas of interest and after consultation with their academic advisor. The courses in the first two semesters of the Bachelor’s programmes convey basic knowledge of natural sciences, mathematics and languages (Indonesian and English). Courses on the different sciences are offered from the third to the sixth semester. During the seventh and eighth semester, students must complete the Community Service and the undergraduate thesis.

The general structure of the Bachelor’s programmes under review is depicted in the following table:

	BAE (SCU / ECTS)	BBE (SCU / ECTS)	BAS (SCU / ECTS)
A. Modules type			
Compulsory modules	133.00 / 226.10	132.00 / 224.40	135.00 / 229.50
Elective modules (minimum)	11.00 / 18.70	12.00 / 20.40	9.00 / 15.30
Total	144.00 / 244.80	144.00 / 244.80	144.00/244.80
B. Teaching method			
Lecture	115.00 / 195.60	112.00 / 190.40	94.00 / 159.80
Practical work	24.00 / 40.80	17.00 / 28.90	40.00 / 68.00
Tutorial	5.00 / 8.50	3.00 / 5.10	00.00 / 00.00
Internship/Community service	3.00 / 5.10	3.00 / 5.10	4.00 / 6.80
Bachelor thesis	6.00 / 10.20	6.00 / 10.20	6.00 / 10.20
Total	144.00 / 244.80	144.00 / 244.80	144.00/244.80

When looking at the individual curricula, however, the auditors notice that the modules and the subsequent workload (cf. criterion 2.2) is distributed among the semester very unevenly. In the BAE programme the first six semester hold a workload between 35 to 37 ECTS credits, while the seventh semester holds 18,7 and the eighth semester only 10,2 ECTS. Similarly, in the BBE programme the first six semesters have a workload of 34 to 39 ECTS, while the last two semesters amount to 11,9 and 18,7 ECTS respectively. In the BAS

programme, this is even more noticeable as here, the first six semesters hold between 34 and 40.5 ECTS, while the last two semesters jointly hold 17 ECTS. Here, the auditors ask the programme coordinators to ensure that the curricula are restructured in a manner that allows for a more even distribution of the modules and thus the workload over the four-years of study.

In terms of internships, there are two schemes: first, field work practice (compulsory), which must be completed in a minimum of four weeks with a predetermined minimum number of hours worked, and second, internships (elective), a regulation on the Merdeka Belajar-Kampus Merdeka (MBKM) which must be completed in a minimum of four months to six months (1 semester) and can be recognized as equivalent to 20 credits. Therefore, students can be confident that they will have enough experience before entering the workforce.

In summary, the peers gain the impression that the choice of modules and the structure of the curriculum ensures that the intended learning outcomes of the respective degree programme can be achieved. They ask UB, however, to consider longer internships with industrial partners to offer the students more opportunities for practical, work-related training.

International Mobility

UB provides opportunities for students to conduct internships and exchange programmes abroad. A list of available exchange and internship programmes that students can participate in is available at UB's International Relation Office. For example, international cooperations with more than 40 different universities and Institutes, in countries such as Australia, Japan, South Korea, Thailand, Germany, USA, Turkey, Netherlands, and New Zealand exist. Student exchange activities are aimed at enhancing students' international insights through learning exchange programs and interacting across cultures.

The new policy of the Indonesian government actively supports any activities outside of the university by releasing a regulation on the Merdeka Belajar-Kampus Merdeka (MBKM), which requires the university to promote students who want to take outside their Bachelor's programme for up to three semesters (Minister of Education and Culture Regulation Number 3 Year 2020). UB recognizes the courses taken by the students outside university based on the equality of the intended learning outcomes. The peers consider this regulation sufficient. However, according to the opinion of the peer group, the academic mobility of the students should be further promoted. The number of Bachelor's students who participate in international exchange programmes is still low despite students' high interest.

The students confirm during the discussion with the peers that some opportunities for international academic mobility exist. However, they also point out that they wish for more places and better endowed scholarships for long and short-term stays abroad. The number of available places in the exchange programmes is still limited and there are restrictions due to a lack of sufficient financial support. UB can only provide limited travel grants, while the demand from students is rising. The lack of financial support hinders students from joining the outgoing programmes.

The peers understand these problems; however, they recommend increasing the effort to further internationalising UB by establishing more international co-operations and exchange programmes and by offering more and better-endowed scholarships. In addition, the peers see that most of the faculty members have international contacts, which can be used for establishing more international co-operations. It is also possible for students and teachers to apply to international organisations like ERASMUS or the German Academic Exchange Council (DAAD) for receiving funds for stays abroad.

In summary, the peers appreciate the effort to foster international mobility and support both Faculties and the respective Departments to further pursuing this path.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Based on the National Standards for Higher Education of Indonesia (SNPT), all three undergraduate programmes under review use a credit point system called SKS. The minimum workload of an undergraduate programme in UB is 144 SKS, which corresponds to 5.760 academic hours or 200 ECTS (1 ECTS is equivalent to 28.8 hours of students' workload). One academic hour is 50 minutes. The normal workload of each regular semester is 720 academic hours, which corresponds to 18 SKS (25.2 ECTS).

To complete the degree programme in time, Bachelor students need to take on average of 18 SKS per semester excluding co-curricular contents. However, the regular schedule usually covers 20-21 SKS per semester to give more space in the last semesters for resits, or

more electives. If a student is not satisfied with his/her GPA, she or he can repeat the classes, but this will lead to a prolongation of the study time.

For regular classes, 1 SKS of academic load for the undergraduate programme is equivalent to 3 academic hours, which equals 150 minutes. This includes:

- one academic hour of scheduled contact with the teaching staff in learning activities,
- one academic hour of structured activities related to lectures, such as doing the assignments, writing papers, or literature study,
- at least one academic hour of independent activity to obtain a better understanding of the subject matters and to prepare academic assignments such as reading references.

For lab work, final project, fieldwork, and other similar activities, 1 SKS is equivalent to 3 to 5 hours a week of student's activities. The details and the students' total workload are described in the respective module description.

In addition, based on the newest national regulation (Permendikbud No. 3/2020), an Indonesian credit unit is defined as activity hour, which is not only limited to attending regular teaching class. The activity may also include internships, student exchange programmes, community service, research, independent study, and teaching. Such activities can be conducted up to two semesters (equivalent to 40 SKS) and must be supervised by an academic advisor.

As has been mentioned in criterion 2.1, the auditors notice that the workload is distributed among the semester very unevenly. In the BAE programme the first six semester hold a workload between 35 to 37 ECTS credits, while the seventh semester holds 18,7 and the eighth semester only 10,2 ECTS. Similarly, in the BBE programme the first six semesters have a workload of 34 to 39 ECTS, while the last two semesters amount to 11,9 and 18,7 ECTS respectively. In the BAS programme, this is even more noticeable as here, the first six semesters hold between 34 and 40.5 ECTS, while the last two semesters jointly hold 17 ECTS. Here, the auditors ask the programme coordinators to ensure that the curricula are restructured in a manner that allows for a more even distribution of the modules and thus the workload over the four-years of study.

During the audit, the students confirm that their workload is generally adequate and that it is possible to finish the degree within the expected four years. They state, however, that the final thesis takes them a lot longer than the allotted 7 SKS. When looking through the final thesis examples the university has provided the auditors confirm that the work necessary to conduct the research and write the thesis should amount to more than 7 SKS. As

such, they ask UB to ensure that the credit points awarded for the final thesis adequately reflect the students' workload.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Various teaching and learning methods (including lectures, computer training and classroom and lab exercises, individual and group assignments, seminars and projects, etc.) have been implemented. Structured activities include tutorials, homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership. The assignments and exercises should help students to develop their abilities with respect to critical thinking, written/oral communication, data acquisition, problem solving, and presentations.

UB has the goal to support the transition from a teacher-centred to a student-oriented and outcome-based education (OBE) in order to involve all students in the learning process and to develop their thinking and analytical skills.

The most common method of learning is class session, with several courses having integrated laboratory practices. Lecturers generally prepare presentations to aid the teaching process. With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods.

Given the large amount of students, especially in the BAS programme the auditors inquire how the teaching can be undertaken and how it can be ensured that all students gain hands-on experience in the laboratories. They learn that student cohorts are broken down into classes of no more than 15 students. Every laboratorial session is supervised and han-

dled directly by the lecturer although he gets support from teaching assistants (senior students who have already participated in this course years before). In order to allow for these smaller classes, sessions take place throughout the entire day, sometimes even on weekends. While the auditors believe UB that they take great efforts in making sure all their students have enough time and space in the laboratories, they nonetheless ask for a schedule that showcases the organization of the different classes.

In summary, the peer group considers 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 concept of all three undergraduate programmes comprises 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).

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

UB 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 5 to 15 students from his classes. He/she 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 peers that they all have an academic advisor.

In general, students stress that the teachers are open minded, communicate well with them, take their opinions and suggestions into account, and changes are implemented if necessary.

The fourth-year students who prepare their final project have one or more supervisors, who are selected based on the topic of the final project. One supervisor could be an external supervisor, if the student performs the research outside UB. The role of the final project supervisor is to guide students in accomplishing their final project, e.g. to finish their research and complete the final project report.

UB has established the Center for Disability Studies and Services (PSLD UB) in 2012, which functions as a research centre on disability issues and the provision of services for people with disabilities at UB. The establishment was motivated by the low number of people with disabilities that are enrolled in higher education in Indonesia. Due to the limited access to higher education for persons with disabilities, less than one percent of persons with disabilities have an undergraduate degree. In Indonesia, the education model for persons with disabilities is still separated, namely by providing special education through special schools or boarding schools. This model separates people with disabilities from non-disabled people in different environments, so that after the completion of the study period, people with disabilities are still not ready to blend in with the environment. Access to higher education is also difficult for persons with disabilities because of the requirement to enter higher education with “no disability”. This also happened at UB, where previously there was no infrastructure, which could be accessed by people with disabilities. This has changed with the establishment of PSLD UB and now students with disabilities are accepted in all programmes at UB and can access the facilities.

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

The peers notice the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice and support for all students. The support 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.

The only weak point the peers notice in an otherwise very comprehensive advisory system is the lack of institutionalised psychological support for students. As the stress for the students during their university education is rather high, there is always the danger of a psychological breakdown or burnout. The students confirm during the discussion with the peers that these problems exist and that they can receive help if they specifically ask for it. However, students have to make the first step and need to seek actively for psychological support. For this reason, the peers are convinced that it would be useful to establish a point of contact for helping students with psychological problems. The respective contact should be made known to all students.

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

Regarding criterion 2.1 – Workload

The university states that all three study programmes admitted that the credit points are unevenly distributed over the various semesters. They give the following explanation: Firstly, all three study programmes adopted the credit semester unit (SCU) system. Individual students can use the system to choose which courses they want to take or retake in the seventh or eighth semester based on previous accomplishments and individual learning goals. Secondly, the system also allows individual students to take more electives in other study programmes to develop their potential and competencies according to their learning aims. Thirdly, as also mentioned in the reports, the student in four years has to complete 144 SCU at a minimum and 160 SCU at a maximum. The last two semesters are designed for individual students to arrange their electives based on their interests to meet the SCU requirement. Those responsible for the study programme believe it can be properly managed.

The auditors thank the university for their explanation and understand that the workload is unevenly distributed to allow students to finish their studies on time if they need to retake certain modules, choose electives or simply cannot take the whole workload during the former semesters. They thus retract from issuing a change.

Regarding criterion 2.1 – Longer internships

The newly launched program called MBKM is a suitable program for students to participate in, which provides an internship for a longer period in the related industries, i.e., up to 6 months with 20 SCU equivalency. The MBKM program also provides a broader industrial sector for students to choose from, e.g., technology start-up, services, agricultural machinery and equipment, food and beverages, plantation, forestry, feed industries, beef cattle industries, dairy cattle industries, breeding, poultry industries, etc. In addition to the MBKM program, there is also a regular internship and community service program that covers 3 SCU. The student can choose freely which internship program he/she participates in.

The auditors are happy with the new MBKM programme and value it as a great opportunity for the students.

Regarding criterion 2.1 – Mobility

In the case of student mobility as concerned by the peers in the same criterion, all three study programmes have two types of classes, i.e., courses given in Indonesian and courses delivered in English. The English class is one of the efforts by the study programme to give

students the opportunity to prepare themselves to get used to an international atmosphere. The study programme will continue to promote various opportunities for international programs to the students. In fact, the numbers of students involved in international programs during 2021 were 35, 45, and 77 for BAE, BBE, and BAS, respectively. In 2021, BAS had 77 students joining international mobility programs. The name of the program includes IISMA (Indonesia International Student Mobility Award), MBKM Internship certified with UPM, Join Supervisor with UPM, Virtual Summer Course Faculty of Animal Science with Faculty of Agriculture Shinzu University, and International Extracurricular Programs involves Rajamangala University of Technology Lanna (Thailand), Vietnam National of Agriculture, Tra Vinh University (Vietnam) and Universitas Brawijaya. In 2021, the distribution of countries in the international mobility of BAS included Italy, Thailand, Malaysia, Japan and Vietnam. We believe the number will increase soon, hopefully after the pandemic ends.

Regarding criterion 2.2 – Bachelor thesis

In criterion 2.2, the auditors were concerned about the SCU of the bachelor's thesis. The auditors ask UB to ensure that the SCU awarded for the bachelor's thesis adequately reflects the student workload. As per the government regulation, as stipulated in Ministry of Education and Culture Decree No. 3 in 2020, the SCU of the bachelor thesis must be 6 SCU, and UB follows the regulation. However, in order to accommodate the auditors' concerns, all three study programmes will award 7 SCU for bachelor's thesis, i.e., 6 SCU for bachelor's thesis and 1 SCU for research proposal and seminar. The three study programmes have a commitment to evaluate further the workload of the bachelor's thesis, which reflects 7 SCU accordingly.

The auditors find this a suitable compromise and asks UB to hand in the updated curriculum that includes the research proposal seminar.

Regarding criterion 2.4 – Support

In criterion 2.4, the auditors highlighted about the lack of institutionalized psychological support for students. In fact, the Faculty of Agricultural Technology (FAT) and Faculty of Animal Science (FAS) both have academic supervisors and a counselling unit, which assist students with psychological support. The counselling unit provides support for student psychological problems related to their academic and life problems. The counseling unit is staffed by a professional counsellor and psychologist, who are ready to help whenever a student needs it. All students are introduced to the counselling unit during campus orientation and are taught how to seek psychological help from it. In addition, the unit also has a student peer counsellor, in which students with preliminary counselling training can help other students solve their problems, as well as an early detection system for peer students

with psychological problems. The works of counselling unit in BAS is based on letter of assignment Number. 1421/UN10.F05/KM/2021. The auditors thank UB for this clarification.

In summary, the auditors deem criterion 2 to be mostly fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- Module descriptions
- Academic Handbooks
- UB Academic Calendar

Preliminary assessment and analysis of the peers:

evaluated based on their attendance and participation in class, their laboratory works and reports, assignments, homework, presentations, mid-term exam, and the final exam at the end of each semester. The form and length of each exam is mentioned in the module descriptions that are available to the students via UB's homepage and the digital platform SI-AM.

The most common type of evaluation used are written examinations; however, quizzes, laboratory work, assignments (small projects, reports, etc.), presentations, seminars, and discussions may contribute to the final grade. Written examinations, either closed-book or open-book, typically include short answers, essays, problem-solving or case-based questions, and calculation problems. Some lecturers also give multiple choice or true-false questions in examinations or quizzes. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams. Students are informed about mid-term and final exams via the Academic Calendar. The final grade is the result of the different activities in the course (e.g. laboratory work, mid-term exam, the final exam, quizzes or other given assignments).

Students must write a report about their internship, which will be evaluated by the responsible teacher at UB using an internship rubric. Students are also obliged to present the results of their internship and share their experiences.

If a student fails, she or he usually has to repeat the entire module in the following year; it is usually not possible to retake just parts of the course or to just retake the final exam.

Although, lecturers need to arrange examinations for students who have not taken the examinations due to valid reasons. Some courses allow students, whose grades are still below the passing level, to improve their grades through repeating an exam.

The peers discuss with the students how many and what kind of exams they have to take each semester. They learn that for each course there is one mid-term exam and one final exam in every semester. Usually, there are additional practical assignments or oral tests. The final grade is the sum of the sub-exams. The students appreciate that there are several short exams instead of one big exam and confirm that they are well informed about the examination schedule, the examination form, and the rules for grading.

Every student in the three undergraduate programmes under review is required to do a final project (Bachelor's thesis). This project is conducted independently under the guidance of one or more supervisors and usually consists of literature study, practical research, and data analysis. Both the student and his /her supervisors might decide the topic and content of the project. In many cases, the lecturers offer particular topics connected to their research. The final project is divided into two parts, namely Final Project 1 (seventh semester) and Final Project 2 (eighth semester). The Final Project 1 consists of literature studies about the possible research project and the preparation of a research plan to be carried out in the Final Project 2. The report about the final project is then presented in front of a group of examiners in seminar format. The examiners consist of the respective supervisors and at least two other lecturers from the faculty (or assigned institutions). It is also possible to conduct an external final project e.g. in co-operation with a company. In this case, one co-supervisor comes from the respective company. With respect to the final project, the peers point out that it would be useful to call it Bachelor's thesis in all programmes and not to use different terms such as final project or graduation project. The term Bachelor's thesis is accepted and understood worldwide; using other terms would leave room for doubts about its scope and goals.

The peers also inspect a sample of examination papers and Bachelor's theses and are overall satisfied with the general quality of the samples.

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

UB does not comment on this criterion.

In summary, the auditors deem criterion 3 to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Reports
- Staff Handbooks
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

At UB, 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. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision depend on the academic position.

The university provides the following table, showcasing the amount of lecturers for each study programme:

	BAE	BBE	BAS
Full-time Lecturers			
Professor	1	-	20
Associate Professor	7	1	26
Assistant Professor	7	10	39
Lecturers	3	-	4
Sub Total	18	11	89
Lecturers from other study programmes and Department			
Professor	2	2	-
Associate Professor	2	8	-
Assistant Professor	19	18	-
Lecturers	4	6	-
Lecturers from other faculties/institution	18	12	23
Total	63	57	112

The current teacher to student ratio for BAE is 1: 31.50, for BBE 1:23 and for BAS 1: 31.23. The university admits that for BAE and BAS, the ratio between teaching staff and students is higher than the ideal standard set by the Directorate of Higher Education as 1:30. There-

fore, currently parallel classes are conducted to ensure students having an effective learning experience (cf. criterion 2.3). As especially the number of students in the BAS programme are high (currently 2.780 in total), the faculty of animal science hired five contracted lecturers holding a PhD in 2019.

The auditors laude that UB is aware of a potential bottleneck in regards to teacher-student ratio and are monitoring the workload of the teaching staff constantly. Especially giving the amount of effort that is put in holding classes for groups of students no larger than 15, the auditors are of the opinion that all three programmes can be carried out effectively with the staff at hand. Since the laboratories thus are in constant use, the auditors recommend increasing the number of laboratory staff and technicians to ease the work of the lecturers in this regard.

The BBE programme is rather new and has been developed as a minor programme in the field of the Bachelor's degree programme BAE in 2011, focusing on biological process conversion and bioproduct engineering. In 2016, the programme was officially labelled an independent study programme by the ministry of education and is only one of three Bioprocess Engineering programmes in the entire country. The auditors are of the opinion, that the curriculum of the study programme looks rather promising, yet they wonder how the modules are being taught since the qualification of the lecturers does not seem to meet the profile of the programme. They learn that UB has the intention to acquire more lecturers from the field of bioprocess engineering either from other (international) universities or directly from the industry. Currently, since the focus of the programme lies on engineering and many of the module are also taught in other engineering programmes at UB, staff members are coming from other faculties. This is further subsidized by highly qualified practitioners from the industry. The auditors understand that the programme can currently be run with the aid of experts from the industry and particularly professors from other related departments. They encourage UB, however, to hire staff members that are directly from the field of bioprocess engineering. They understand that given the shortage of these study programmes in Indonesia it will be hard finding Indonesian professionals in this field, so they urge UB to invite foreign professors.

The majority of the teachers have graduated from universities outside of the UB. Several hold PhD from overseas (for example, from France, Germany, Australia, USA, Japan, Taiwan, and Thailand) or are currently pursuing a PhD overseas (for example, in Austria, Belgium, Malaysia, Korea, Taiwan, and Thailand). The peers appreciate this international background.

The peers discuss with UB's management how new staff members are recruited. They learn that every year the faculties and departments announce their vacancies to UB's management, which subsequently announces the vacancies on UB's webpage. One way to recruit new teachers is to send promising Master's students from UB abroad to complete their PhD and then to hire them as teachers when they are finished.

In summary, the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

The auditors are impressed by the excellent and open-minded atmosphere among the students and the staff members. This atmosphere of understanding and support is one of the strong points of the degree programmes.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Reports
- Staff handbook
- Discussions during the audit

Preliminary assessment and analysis of the peers:

UB encourages training of its academic and technical staff for improving the didactic abilities and teaching methods. As described in the Self-Assessment Reports, faculty members and non-academic staff regularly participate in training or workshops. Every year, the together with the Heads of Departments and Study Programmes map the competencies of their staff, analyse organisational needs for continuous improvement, and make plans for annual work programmes in line with the faculty's and university's strategic plans.

To this end, UB has established several programmes to support staff development. New staff members are required to undertake an intensive basic training programme called Pre-Service or Pra-Jabatan. Following Pra-Jabatan, lecturers are required to undertake Training for the Development of Basic Skills in Instructional Techniques (PEKERTI) and Applied Approach (AA) to develop teaching and management skills. In addition, lecturers are required to take a lecturer certification and obtain an educator certificate (SERDOS) that shows their recognition as a professional staff. In addition, lecturers are mentored by their seniors to develop their expertise and to advance their career. Finally, UB provides awards for high performing and high achieving staffs, such as the Governance, Innovation, Reputation, Alumni, Faculty, Fund, and Efficiency (GIRAFFE) Award.

Faculty members can also further develop their competencies through several activities such as post-doctoral programmes, training, workshops, joint research, etc. Moreover, they are encouraged to present their research papers in national and international conferences, and to collaborate with colleagues from international universities.

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at UB, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars; even a sabbatical leave is possible.

In summary, the auditors confirm that UB offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Reports
- Video of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Basic funding of the undergraduate programmes and the facilities is provided by UB, the Faculty of Animal Science and the Faculty of Agricultural Technology. Additional funds for research activities can be provided by UB or the Indonesian government (Bantuan Pendaan Perguruan Tinggi Nasional, BPPTN), but the teachers have to apply for them. In addition, there are several co-operations with industrial partners.

The provided budget allows the departments to conduct the study programmes as well as some specific activities, including student exchange programmes, student financial assistance for research, and participation in international conferences.

The programme coordinators emphasise that from their point of view, all three undergraduate programmes receive sufficient funding for teaching and learning activities. Hence, the Departments do not face any financial shortages. Of course, there is limited funding to modernize or add laboratory equipment, but there are sufficient resources for adequately teaching the classes.

From the provided documents and videos of the laboratories, the peers deduct that there seem to be no severe bottlenecks due to missing equipment or a lacking infrastructure. The basic technical equipment for teaching the students is available, although it is not state of the art in all cases. The students confirm during the discussion with the peers that, in general, they are satisfied with the available equipment, but several instruments are outdated. Moreover, the peers learn during the audit that students can use and operate the instruments in the laboratories by themselves after being trained and instructed by either senior students or lab technicians. Each laboratory has a lab supervisor; in addition, there are several senior students, which work as lab assistants. In addition, teachers and students can use the facilities of UB's central laboratory. Here, more sophisticated instruments are available and lab technicians are present to operate them. Teachers have to apply for using the facilities and are charged for the provided services.

The peers emphasise that all students need to have the opportunity to get hands on experience in carrying out laboratory experiments. They learn from the students, however, that in the BBE and the BAS programme not enough equipment, instruments and materials are available at all times to guarantee each student being able to conduct the experiment on his own. While the groups of students working together are generally rather small, the peers see no severe disadvantage here. Yet they nonetheless recommend to increase the equipment, instruments and materials to adapt to the rising number of students in these programmes. As has been mentioned already under criterion 4.1, since the laboratories thus are in constant use, the auditors recommend increasing the number of laboratory staff and technicians to ease the work of the lecturers in this regard.

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

Regarding criterion 4.1 – Staff

In their statement, the university agrees that all three study programmes are understaffed based on teacher-to-student ratio. The UB administration is committed to improving the situation and welcomed the auditors' suggestion. For the BBE case, in short terms, it will invite professors, academia, and professionals, foreign or nationals, in Bioprocess Engineering or related science, to give lectures in BBE, either by classical method or online method. For longer terms, the BBE will have a talent pooling program in which the best graduates who have potential will be encouraged to pursue postgraduate education in Bioprocess Engineering and, in return, be eligible to be teachers. All three study programme also have a 3in1 program, in which foreign professors, academia, and professionals give a lecture for at least seven meetings (half semester) in related courses to the student.

Regarding criterion 4.3 – Equipment

To guarantee each student can conduct an experiment properly with state-of-the-art equipment, UB has increased laboratory equipment in 2021 and allocated budget for increasing the equipment annually. In 2022–2025, UB will provide a budget for laboratory equipment and development. UB also has a plan to increase the number of laboratory staff to support the activity in the laboratory. The FAT and FAS have also agreed to provide additional funding for laboratory equipment. Both faculties are currently building a new building which will be commenced in 2022 as an effort to facilitate the newly procured laboratory equipment.

In summary, the auditors deem criterion 4 to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Reports
- Module descriptions
- Webpages of the study programmes

Preliminary assessment and analysis of the peers:

After studying the module descriptions, the peers see that the degree programmes all make use of different templates and that the provided information is not complete in the case of the BAS programme. Here, missing module descriptions must be provided by UP.

For the BBE programme much information is missing or only partially available in certain module descriptions. This includes the type of teaching and the contact hours, the workload that is only summed up for semesters, the often incomprehensible ILOs that are restricted to knowledge but do not include neither skills nor competencies, literature and media employed. In addition, these module descriptions do not always make transparent, how each exam contributes to the final grade and what kind of exam is required. In addition, the calculation of the students' total workload and the conversion into credits is either missing or not transparent.

A good example is the module handbook for the BAE programme; here all necessary information is included. UB should also use the same template for all module descriptions.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Reports
- Sample Diploma for each degree programme
- Sample Diploma Supplement for each degree programme

Preliminary assessment and analysis of the peers:

The peers confirm that the students of all three degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Diploma Supplement contains all necessary information about the degree programme including acquired soft skills and awards (extracurricular and co-curricular activities). The Transcript of Records lists all the courses that the graduate has completed, the achieved credits, grades, and cumulative GPA.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Reports
- All relevant regulations as published on the university's webpage

Preliminary assessment and analysis of the peers:

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

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

Regarding criterion 5.1 – Module descriptions

As concerned with criterion 5, the auditors ask UB to standardize the module handbook for all study programmes. The UB administration is committed to improving the situation and

welcomed the auditors' suggestion. A meeting to synchronize the module description template will be conducted soon, which will involve all stakeholders. BAS has improved the module handbook by completing the module descriptions.

In summary, the auditors deem criterion 5 to be fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors discuss the quality management system at UB with the programme coordinators and the students. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal (IQAS) and external quality assurance (EQAS).

There are three levels of quality assurance implementation. At the university level, it is conducted by the Quality Assurance Centre (Pusat Jaminan Mutu, PJM), at the faculty level, it is conducted by the Quality Assurance Group (Gugus Jaminan Mutu, GJM), and at the department level it is conducted by the Quality Assurance Unit (Unit Jaminan Mutu, UJM). At the end of every year, PJM conducts internal audits for all Bachelor's degree programme. During this process, the programme coordinators assess the quality of all learning and teaching procedures based on the KPIs set by PJM. From these evaluations, room for improvement is identified. The Heads of Department lead a meeting to evaluate teaching and learning process within the department once each semester. In the meeting, availability of supporting resources, i.e., laboratory equipment, teaching methods, and administration services are discussed. At faculty level, a coordination meeting is conducted every semester to evaluate teaching and learning processes and supporting resources.

Internal evaluation of the quality of the degree programmes is mainly provided through student surveys. The students give their feedback on the courses by filling out the questionnaire online. Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on UB's digital platform. The questionnaires are used to

monitor and evaluate the learning processes and are distributed every semester to the lecturers before the final exam is done. A summary of the students' feedback is sent to the respective lecturers. Based on the results, the programme coordinator and the teachers reassess every course and possibly some changes are made. If there are negative results, the Department Head invites the concerned teacher to discuss about his or her teaching methods and thus, they are expected to enhance their performance in the future.

Finally, students also have the opportunity to give direct feedback via the suggestion box. The community inside and outside of the university can give online feedback to the university, faculty and department through UB-care, which can be openly accessed.

The auditors gain the impression that the Departments take the students' feedback seriously and changes are made if necessary. Nevertheless, the peers see that the results of the course questionnaires are not discussed with the students. Consequently, the peers expect UB to inform students about the results of the questionnaires and the teachers should discuss with them about possible improvements in the respective course. The feedback loops need to be closed.

Moreover, students confirm during the audit that they are not represented in the university's boards and, thus, are not directly involved in the decision-making processes. The peers are convinced that it would be very useful to have student members in the different boards. For this reason, they recommend that student representatives should be members of boards at UB (at least on programme and faculty level) and be actively involved in the decision-making processes for further developing the degree programmes.

UB regularly conducts an alumni tracer study. By taking part at this survey, alumni can comment on their educational experiences at UB, the waiting period for employment after graduation, their professional career and can give suggestions how to improve the programme. Moreover, the employers are asked to give feedback to UB on employability and acquired competencies of UB's graduates. During the audit, the employers express their general satisfaction with the qualification profile.

External quality assurance focuses on both national and international accreditations. National accreditation is conducted by the National Accreditation Board for Higher Education (BAN-PT), under the Ministry of Education and Culture, Republic of Indonesia. National accreditation of the programme within the university is a legal obligation for every study programme.

The peers discuss with the representatives of UB's partners from public institutions and private companies if there are regular meetings with the partners on faculty or department level, where they discuss the needs and requirements of the employers and possible

changes to the degree programmes. They learn that some employers and alumni invited to give their feedback on the content of the degree programmes. The peers appreciate that UB stays in contact with its alumni and has a close relation with its partners from the industry. However, no Academic Advisory Board exists. As the peers consider the input of the employers to be very important for the further improvement of the degree programmes, they appreciate the existing culture of quality assurance with the involvement of employer in the quality assurance process. Nevertheless, they recommend establishing Academic Advisory Boards at each department. The advisory board should consist of a group of professionals, employers, and experts of the relevant fields from outside the university (e.g. companies, high schools, and governmental institutions).

In summary, the peer group confirms that the quality management system at UB is, besides the mentioned deficits, suitable to identify weaknesses and to improve the degree programmes.

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

The university states that in all three study programmes the results of the evaluations (surveys) are reported in a meeting with the student association representatives, which is held twice a year at the end of the semester. This meeting also discusses the problems during each semester as well as possible solutions and improvements. It also gives opportunity to the student association representatives to submit suggestions for improvement of all aspects of the study programme. While this is indubitably a very important aspect, the auditors clarify that the results of the survey must be discussed with each individual class to allow every student a discussion of his or her suggestions or critique.

With regard to the recommendation to make student representatives members of the board of UB, UB clarifies that they already have a student as a representative on their board since the end of 2021 as Universitas Brawijaya's status has changed from Public Service Agency to Legal Entity State University. In addition, all three programmes are committed to form Academic Advisory Board, which will consist of a group of professionals, employers and experts of the relevant field. In January of 2022 BAS already established their advisory boards that consist of five members.

In summary, the auditors deem criterion 6 to be mostly fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- Schedule for organizing the laboratory time for the different groups of students in Animal Science

E Comment of the Higher Education Institution (31.01.2022)

The institution provided a detailed statement as well as the following explanation on the organization of the laboratory time:

“The Faculty of Animal Science have one study Program (Bachelor of Animal Science/BAS) and all of Laboratory Facilities only for academic learning process of BAS. Regarding the suggestion from the reviewer, the additional document requesting of schedule for organizing the laboratory time for the different groups of students in Animal Science.

In each semester, student practicum activities are held according to the applicable academic calendar schedule. This is done to facilitate practicum activities and avoid the occurrence of inter-courses in one laboratory or students getting schedules at the same time. In BAS, there are approximately 40 students in one class divided into groups of 5 students/group. For example, in the schedule for organizing the laboratory time in BAS, A1 explains the name of class A and number 1 describes the order of groups so that the following group naming are A2, A3, A4,, S1, S2, and S3 sequentially according to the order of classes and groups. Here the attachment a schedule for organizing the laboratory time in BAS.”

The university hands in the following appendices:

- The schedule arrangement carried out by the study program by comparing all existing laboratories and courses with practicums along with their semesters
- The existing arrangements in each laboratory and the divisions under it along with the practicum held in each semester.
- The timeline of each laboratory and division along with practicum materials and the division of student groups
- List of laboratory equipment (additional) of BAS in 2021
- Photos/equipment documentation

F Summary: Peer recommendations (01.03.2022)

Taking into account the additional information and the comments given by UB the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Agricultural and Biosystems Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council
Ba Bioprocess Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council
Ba Animal Science	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) Ensure that the credit points awarded for the thesis adequately reflect the students' workload.
- A 2. (ASIIN 6) Close the feedback cycles and make sure that the teachers discuss with all students of the course the results of the questionnaires and what changes might be possible.

For the Ba Bioprocess Engineering

- A 3. (ASIIN 5.1) The module descriptions must be rewritten to include precise information about the content and learning outcomes of each course.

Recommendations

For all degree programmes

- E 1. (ASIIN 4.1) It is recommended to increase the number of laboratory staff and technicians.
- E 2. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students and to cooperate with further international universities.
- E 3. (ASIIN 6) It is recommended to make student representatives members of the boards at UB and to directly involve them in the decision making processes for further developing the degree programmes.

For the Ba Animal Science and the Ba Bioprocess Engineering

- E 4. (ASIIN 4.3) It is recommended to increase the equipment, instruments and materials in the laboratories.

For the Ba Bioprocess Engineering

- E 5. (ASIIN 4.1) It is recommended to increase the personnel with an academic background in Bioprocess Engineering.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering/Process Engineering (07.03.2022)

Assessment and analysis for the award of the ASIIN seal:

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

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Agricultural and Biosystems Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council
Ba Bioprocess Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council

Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture (10.03.2022)

Assessment and analysis for the award of the ASIIN seal:

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

The Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Agricultural and Biosystems Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council
Ba Animal Science	With requirements for one year	30.09.2027	–	/

Technical Committee 10 – Life Sciences (04.03.2022)

Assessment and analysis for the award of the ASIIN seal:

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

The Technical Committee 08 – Agriculture, Nutritional Sciences and Landscape Architecture recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Bioprocess Engineering	With requirements for one year	30.09.2027	EUR-ACE®	Depending on the decision of the ENAEE Administrative Council

H Decision of the Accreditation Commission (18.03.2022)

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

The accreditation commission discusses the procedure and generally follows the assessment of the auditors and technical committees. For reasons of consistency between the different clusters that are up for accreditation simultaneously, they change the wording of requirement A2.

Assessment and analysis for the award of the EUR-ACE® Label:

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Agricultural and Biosystem Engineering	With requirements for one year	30.09.2027
Ba Bioprocess Engineering	With requirements for one year	30.09.2027
Ba Animal Science	With requirements for one year	30.09.2027

The Accreditation Commission recommends the award of the seals as follows:

Degree Programme	EUR-ACE Label	Maximum duration of accreditation
Ba Agricultural and Biosystem Engineering	With requirements for one year	Depending on the decision of the ENAEE Administrative Council
Ba Bioprocess Engineering	With requirements for one year	Depending on the decision of the ENAEE Administrative Council

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) Ensure that the credit points awarded for the thesis adequately reflect the students' workload.
- A 2. (ASIIN 6) Close the feedback cycles and make sure that the teachers discuss with their students about the results of the questionnaires and what changes might be possible.

For the Ba Bioprocess Engineering

- A 3. (ASIIN 5.1) The module descriptions must be rewritten to include precise information about the content and learning outcomes of each course.

Recommendations

For all degree programmes

- E 1. (ASIIN 4.1) It is recommended to increase the number of laboratory staff and technicians.
- E 2. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students and to cooperate with further international universities.
- E 3. (ASIIN 6) It is recommended to make student representatives members of the boards at UB and to directly involve them in the decision making processes for further developing the degree programmes.

For the Ba Animal Science and the Ba Bioprocess Engineering

E 4. (ASIIN 4.3) It is recommended to increase the equipment, instruments and materials in the laboratories.

For the Ba Bioprocess Engineering

E 5. (ASIIN 4.1) It is recommended to increase the personnel with an academic background in Bioprocess Engineering.

I Fulfilment of Requirements (24.03.2023)

Analysis of the peers and the Technical Committee/s (16.03.2023)

Requirements

For all degree programmes

- A 1. (ASIIN 2.2) Ensure that the credit points awarded for the thesis adequately reflect the students' workload.

Initial Treatment	
Peers	Fulfilled Justification: The credits for the Bachelor thesis have been increased from 6 SCU to 8 SCU. They consist of 6 SCU Bachelor Thesis, 1 SCU Bachelor Thesis Proposal and Seminar and 1 SCU Bachelor Thesis Writing and Supervision. The university should be notified that the credit points must be updated in the module description for the Bachelor thesis.
TC 01	fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 08	fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 10	fulfilled Justification: The technical committee follows the assessment of the auditors.

- A 2. (ASIIN 6) Close the feedback cycles and make sure that the teachers discuss with their students the results of the questionnaires and what changes might be possible.

Initial Treatment	
Peers	Fulfilled

	Justification: Universitas Brawijaya has implemented new regulations, starting in the semester 2022/2023. Among others the students can now access the feedback via an online platform and lecturers directly discuss the feedback with the students.
TC 01	fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 08	fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 10	fulfilled Justification: The technical committee follows the assessment of the auditors.

For the Bachelor’s programme Bioprocess Engineering

A 3. (ASIIN 5.1) The module descriptions must be rewritten to include precise information about the content and learning outcomes of each course.

Initial Treatment	
Peers	Not (completely) fulfilled Justification: All module descriptions have been updated. However, some parts are still missing. For example, in the field “type of teaching, contact hours”, one solely finds the information “contact hours and class size separately for each teaching method”. In addition, the learning outcomes /objectives seem in some cases rather constructed, e.g. for Thermodynamics: “This course contains interest formulas, cost concepts, annual and present value equivalents, rate of return (RoR), break even point (BEP), sensitivity analysis, and other technical analysis.”
TC 01	Not completely fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 08	Not completely fulfilled Justification: The technical committee follows the assessment of the auditors.
TC 10	not completely fulfilled. Justification: The technical commission discusses the module descriptions and finds that the description for “thermodynamic” to be mistaken. The module descriptions must be reworked.

Decision of the Accreditation Commission (24.03.2023)

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Agricultural and Biosystem Engineering	Without requirements	30.09.2027
Ba Bioprocess Engineering	Requirement 3 not fulfilled	6 months prolongation
Ba Animal Science	Without requirements	30.09.2027

Degree Programme	EUR-ACE Label	Maximum duration of accreditation
Ba Agricultural and Biosystem Engineering	With requirements for one year	Depending on the decision of the ENAEE Administrative Council
Ba Bioprocess Engineering	Requirement 3 not fulfilled	Depending on the decision of the ENAEE Administrative Council

Requirements

For the Ba Bioprocess Engineering

- A 1. (ASIIN 5.1) The module descriptions must be rewritten to include precise information about the content and learning outcomes of each course.

Appendix: Programme 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 programme Agricultural and Biosystems Engineering:

Table 1.1. BAE study programme learning outcomes (PLO)

PLO	Programme Learning Outcomes (PLO)	Related ILO
PLO 1	Competence and confidence agricultural machinery and system designer	ILO 1
PLO 2	An enquiring mind and life-long learning professional	ILO 2
PLO 3	Globally aware and dynamic engineer in managing sustainable resources	ILO 3
		ILO 4
		ILO 5
		ILO 6
PLO 4	Enterprising innovator involving community engagement	ILO 7

Table 1.2. BAE study programme intended learning outcomes (ILO)

	Intended Learning Outcomes (ILO)
ILO 1	An ability to use engineering principles in designing technology products related to the field of agricultural engineering science
ILO 2	Having an attitude, creative and innovative thinking consistently following professional ethics
ILO 3	An ability to manage and utilize natural resources (agriculture and environment) and supporting resources (human resources, infrastructure, etc.) in an optimal and sustainable way
ILO 4	Having an attitudes and professional behaviour as well as having strong leadership and the ability in effective scientific communication
ILO 5	An ability to identify, formulate, analyse and solve problems in the field of agricultural engineering through systems approach
ILO 6	An ability to conduct research, explore, develop and apply science and technology in the field of agricultural engineering science
ILO 7	An ability to develop and manage entrepreneurship oriented to agribusiness and agroindustry

The following **curriculum** is presented:

SEMESTER 1						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
MPK4001	ISLAMIC RELIGION	Choose according to student beliefs	C	3	136.00	5.10
MPK4002	CATHOLIC RELIGION		C	3	136.00	5.10
MPK4003	PROTESTAN CHRISTIAN RELIGION		C	3	136.00	5.10
MPK4004	HINDUISM RELIGION		C	3	136.00	5.10
MPK4005	BUDDHISM RELIGION		C	3	136.00	5.10
MPK4006	CIVIC EDUCATION		C	3	136.00	5.10
TPF4013	ENGLISH LANGUAGE		C	3	136.00	5.10
TPE4127	GENERAL MATHEMATICS		C	2	90.67	3.40
TPE4131	PHYSICS		C	3	136.00	5.10
			P	1	45.33	1.70
TPF4121	GENERAL CHEMISTRY		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4101	INTRODUCTION TO AGRICULTURAL TECHNOLOGY		C	2	90.67	3.40
TPF4120	BIOLOGY		C	2	90.67	3.40
			P	1	45.33	1.70
	TOTAL			22	997.33	37.40
SEMESTER 2						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
MPK4007	INDONESIAN LANGUAGE		C	3	136.00	5.10
MPK4008	PANCASILA		C	2	90.67	3.40
TPF4241	ORGANIC CHEMISTRY		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4246	CALCULUS 1	TPE4127	C	2	90.67	3.40
TPF4242	STATISTICS		C	2	90.67	3.40
			T	1	45.33	1.70
TPE4299	AGRICULTURAL SCIENCE AND BIOSYSTEM		C	2	90.67	3.40
			P	2	90.67	3.40
TPE4233	COMPUTER APPLICATION		C	1	45.33	1.70
			P	1	45.33	1.70
TPE4207	AGRICULTURAL MATERIAL		C	2	90.67	3.40
	TOTAL			21	952.00	35.70

SEMESTER 3						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPE4137	THERMODINAMICS	TPE4131	C	2	90.67	3.40
			T	1	45.33	1.70
TPE4103	STATICS AND DYNAMICS		C	2	90.67	3.40
			T	1	45.33	1.70
TPE4106	FLUID MECHANICS		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4136	TECHNICAL DRAWING		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4151	ENVIRONMENTAL MEASUREMENT		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4010	ENGINEERING ECONOMICS		C	3	136.00	5.10
TPE4152	CALCULUS 2	TPE4246	C	2	90.67	3.40
			T	1	45.33	1.70
	TOTAL			21	952.00	35.70
SEMESTER 4						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPE4232	APPLIED MATHEMATICS	TPE4246	C	2	90.67	3.40
			T	1	45.33	1.70
TPE4206	STRENGTH OF MATERIAL	TPE4103	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4236	CONTROL SYSTEM	TPE4151	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4249	ENGINEERING MATERIAL SCIENCE		C	2	90.67	3.40
TPE4231	HEAT TRANSFER	TPE4137	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4234	POWER IN AGRICULTURE 1	TPE4137	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4252	ERGONOMIC AND OCCUPATIONAL HEALTH AND SAFETY		C	2	90.67	3.40
TPE4261	FOOD PHYSICAL PROPERTIES		C	2	90.67	3.40
	TOTAL			21	952.00	35.70

SEMESTER 5						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPE4141	WORKSHOP		C	2	90.67	3.40
			P	1	45.33	1.70
TPI4011	BUSINESS MANAGEMENT		C	2	90.67	3.40
TPE4145	FOOD PROCESSING TECHNIQUE & AGRICULTURAL PRODUCTS	TPE4231	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4148	NUMERICAL METHOD	TPE4246	C	2	90.67	3.40
TPE4109	MACHINE ELEMENT DESIGN	TPE4206	C	2	90.67	3.40
TPE4006	AGRICULTURAL ELECTRICITY AND ENERGY		C	2	90.67	3.40
			P	1	45.33	1.70
TPF4011	RESEARCH METHOD AND		C	2	90.67	3.40
TPE4142	FARM BUILDING		C	2	90.67	3.40
TPE4119	OPERATIONAL UNIT	TPE4231	C	2	90.67	3.40
	TOTAL			21	952.00	35.70
SEMESTER 6						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPF4240	PERSONALITY DEVELOPMENT AND PROFESSIONAL ETHICS		C	2	90.67	3.40
TPF4012	AGRO-INDUSTRIAL ENTREPRENEURSHIP		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4211	DESIGN OF AGRICULTURAL TOOLS AND MACHINARIES	TPE4109	C	2	90.67	3.40
			P	1	45.33	1.70
TPE4237	OPERATIONAL RESEARCH		C	2	90.67	3.40
TPE4253	AGRICULTURAL CULTIVATION TOOLS AND MACHINARIES	TPE4234	C	2	90.67	3.40
			T	1	45.33	1.70
TPE4212	LAND SURVEYING AND MAPPING		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4251	SYSTEMS ENGINEERING		C	2	90.67	3.40
UBU4007	INTERNSHIP/	CHOOSE ONE	C	3	136.00	5.10
UBU4002	STUDENT COMMUNITY SERVICE		C	3	136.00	5.10
	TOTAL			21	952.00	35.70

SEMESTER 7						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
UBU4001	UNDERGRADUATE THESIS		C	6	272.00	10.20
	<i>ELECTIVE 1</i>		C	2	90.67	3.40
	<i>ELECTIVE 2</i>		C	2	90.67	3.40
			P	1	45.33	1.70
	TOTAL			11	498.67	18.70
SEMESTER 8						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
	<i>ELECTIVE 1</i>		C	2	90.67	3.40
			P	1	45.33	1.70
	<i>ELECTIVE 2</i>		C	2	90.67	3.40
			P	1	45.33	1.70
	TOTAL			6	272.00	10.20
	GRAND TOTAL			144		240.80

According to the self-assessment report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Bioprocess Engineering:

Table 1.3 BBE study programme learning outcomes (PLO)

PLO	Programme Learning Outcomes (PLO)	Related ILO
PLO 1	Graduates acquire professional leadership roles in bioprocess engineering and related fields leading to successful career	ILO 1, 2, 3, 4, 5
PLO 2	Graduates establish commitment and contributes toward sustainable and bio-based economy development for better society	ILO 1, 2, 3, 7
PLO 3	Graduates engage in lifelong learning in conducting practical engineer tasks	ILO 4, 5, 6, 7

Table 1.4. BBE study programme intended learning outcomes (ILO)

	Intended Learning Outcomes (ILO)
ILO 1	To acquire a sound knowledge in mathematics and natural science and apply engineering principles in determining and solving contemporary and complex problems related to bioprocessing.
ILO 2	To formulate and operate conversion processes of biological resources into bio-based value-added materials related to food, feed, fuels, pharmaceutical, nutraceutical, biomaterials or biochemicals.
ILO 3	To design biological reaction and reactors including its materials, instrumentation, control, and modelling.
ILO 4	To communicate creative idea and work effectively within professional community and larger society.
ILO 5	To demonstrate an ability to work in multidisciplinary and multicultural teams in developing innovative engineering solutions using complex problem-solving skills.
ILO 6	To conduct practice-based tasks related to bioprocessing in a responsible, safe, voluntary, self-motivated and ethical manner.
ILO 7	To appraise bioprocessing and bioproducts manufacturing and valorisation using entrepreneurship principles.

The following curriculum is presented:

SEMESTER 1						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
MPK4001	ISLMIC RELIGION	Choose according to student beliefs	C	3	136.00	5.10
MPK4002	CATHOLIC RELIGION		C	3	136.00	5.10
MPK4003	PROTESTAN CHRISTIAN RELIGION		C	3	136.00	5.10
MPK4004	HINDUISM RELIGION		C	3	136.00	5.10
MPK4005	BUDDHISM RELIGION		C	3	136.00	5.10
MPK4006	CIVIC EDUCATION			C	3	136.00
TPF4013	ENGLISH LANGUAGE		C	3	136.00	5.10
TPE4127	GENERAL MATHEMATICS		C	2	90.67	3.40
TPE4131	PHYSICS		C	3	136.00	5.10
			P	1	45.33	1.70
TPF4121	GENERAL CHEMISTRY		C	2	90.67	3.40
			P	1	45.33	1.70
TPO4101	INTRODUCTION TO BIOPROCESS ENGINEERING		C	2	90.67	3.40
TPF4120	BIOLOGY		C	2	90.67	3.40
			P	1	45.33	1.70
	TOTAL			22	997.33	37.40
SEMESTER 2						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
MPK4007	INDONESIAN LANGUAGE		C	3	136.00	5.10
MPK4008	PANCASILA		C	2	90.67	3.40
TPF4241	ORGANIC CHEMISTRY		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4246	CALCULUS 1	TPE4127	C	2	90.67	3.40
TPP4260	GENERAL MICROBIOLOGY		C	2	90.67	3.40
			P	2	90.67	3.40
TPE4233	COMPUTER APPLICATION		C	1	45.33	1.70
			P	1	45.33	1.70
TPO4201	ENGINEERING MECHANICS		C	2	90.67	3.40
			T	1	45.33	1.70
TPO4202	FOOD CHEMISTRY		C	2	90.67	3.40
	TOTAL			21	952.01	35.70

SEMESTER 3						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPE4137	THERMODINAMICS	TPE4131	C	2	90.67	3.40
			T	1	45.33	1.70
TPO4102	TRANSPORT PHENOMENA 1	TPE4131	C	2	90.67	3.40
TPO4103	COMPUTER AIDED DESIGN (CAD)		C	2	90.67	3.40
			P	1	45.33	1.70
TPO4104	AUTOMATIZATION 1		C	2	90.67	3.40
			P	1	45.33	1.70
TPE4152	CALCULUS 2	TPE4246	C	2	90.67	3.40
			T	1	45.33	1.70
TPO4105	BASIC BIOCHEMISTRY		C	2	90.67	3.40
TPF4010	ENGINEERING ECONOMICS		C	3	136.00	5.10
	TOTAL			19	861.34	32.30
SEMESTER 4						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPO4203	APPLIED MATHEMATICS IN BIOPROCESS	TPE4152	C	2	90.67	3.40
			T	1	45.33	1.70
TPO4204	CHEMICAL REACTION ENGINEERING	TPE4137	C	2	90.67	3.40
			P	1	45.33	1.70
TPO4205	TRANSPORT PHENOMENA 2	TPO4102	C	2	90.67	3.40
TPO4206	AUTOMATIZATION 2	TPO4104	C	2	90.67	3.40
			P	1	45.33	1.70
TPO4207	OPERATIONAL MANAGEMENT		C	2	90.67	3.40
			P	1	45.33	1.70
TPO4208	BIOPROCESS UNIT OPERATION		C	2	90.67	3.40
			P	1	45.33	1.70
TPO4209	BASIC BIOTECHNOLOGY	TPP4105	C	2	90.67	3.40
TPE4237	OPERATIONAL RESEARCH		C	2	90.67	3.40
	TOTAL			21	952.01	35.70

SEMESTER 5						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPO4106	BIOSEPARATION ENGINEERING		C	2	90.67	3.40
			P	1	45.33	1.70
TPI4011	BUSINESS MANAGEMENT		C	2	90.67	3.40
TPO4107	ITERATIVE METHOD	TPE4152	C	2	90.67	3.40
TPO4108	BASIC FERMENTATION	TPP4260,TPO4105	C	2	90.67	3.40
TPO4109	INSTRUMENTS ANALYSIS		C	3	136.00	5.10
TPF4011	SCIENTIFIC METHOD		C	2	90.67	3.40
TPF4104	BIOMATERIALS		C	3	136.00	5.10
TPO4110	EXPERIMENTAL DESIGN		C	2	90.67	3.40
			P	1	45.33	1.70
	TOTAL			20	906.68	34.00
SEMESTER 6						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
TPF4240	PERSONALITY DEVELOPMENT AND PROFESSIONAL ETHICS		C	2	90.67	3.40
TPF4012	AGRO-INDUSTRIAL ENTREPRENEURSHIP		C	2	90.67	3.40
			P	1	45.33	1.70
TPO4210	DESIGN OF BIOREACTOR	TPO4204	C	3	136.00	5.10
			P	1	45.33	1.70
TPB4264	ENZYME TECHNOLOGY		C	3	136.00	5.10
TPO4211	FERMENTATION TECHNOLOGY	TPO4108	C	3	136.00	5.10
TPE4239	BIOENERGY ENGINEERING		C	2	90.67	3.40
TPI4251	PLANT DESIGN		C	3	136.00	5.10
UBU4007	INTERNSHIP/	CHOOSE ONE	C	3	136.00	5.10
UBU4002	STUDENT COMMUNITY SERVICE		C	3	136.00	5.10
	TOTAL			23	1042.67	39.10

SEMESTER 7						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
	<i>ELECTIVE 1</i>		C	2	90.67	3.40
			P	1	45.33	1.70
	<i>ELECTIVE 2</i>		C	2	90.67	3.40
	<i>ELECTIVE 3</i>		C	2	90.67	3.40
	TOTAL			7	317.34	11.90
SEMESTER 8						
CODE	COURSES	REQUIREMENT	C/P/T	SCU	TOTAL HOURS	ECTS
UBU4001	UNDERGRADUATE THESIS		C	6	272.00	10.20
	<i>ELECTIVE 1</i>		C	2	90.67	3.40
			P	1	45.33	1.70
	<i>ELECTIVE 2</i>		C	2	90.67	3.40
	TOTAL			11	498.67	18.70
	GRAND TOTAL			144		240.80

According to the self-assessment report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Animal Science:

PLO	Programme Learning Outcomes (PLO)	Related ILO
1	To create graduates in Animal Science with good academic achievement, having the spirit of entrepreneurship, moral and noble character, insight into the latest technology and being able to compete at national and international levels.	ILO 1, 2, 3, 6, 7, 11, 13
2	To lead innovation on Animal Science and contribute to the economic development of the country based on noble cultural values at national and international levels.	ILO 2, 4, 5, 7, 8, 9, 12
3	To establish a friendly education environment, competitive insight into the latest technology to develop the potential of academics	ILO 3, 5, 6, 9, 12
4	To establish international study programme governance applying credible, transparent, accountable, efficient, objective, advance, and sustainable standard	ILO 7, 9, 10, 11, 13

Table 1.6. BAS study programme intended learning outcomes (ILO)

No.	Domain	Intended Learning Outcomes (ILO)
ILO 1	Attitude	Believing in one God based on Pancasila, social justice and integrity.
ILO 2	Attitude	Contributing to the escalation and development of quality of life locally and globally.
ILO 3	Attitude	Developing awareness of Animal welfare and halal issue.
ILO 4	Knowledge	Capability to develop knowledge and comprehensive mindset based on Animal science and industry.
ILO 5	Knowledge	Capability to analyse the development and implementation of technology through humanities, ethical and scientific value as to provide appropriate solutions and ideas.

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ILO 6	Knowledge	Proficient in biology, physiology, animal nutrition, breeding, farm management, and implementation in Animal Science.
ILO 7	Skill (General)	Capability to perform an independent, standardized, measurable, effective, efficient and sustainable work.
ILO 8	Skill (General)	Capability to perform effective team work and a self-evaluation.
ILO 9	Skill (General)	Capability to effectively communicate the thought, concept, implementation and analysis in oral and written form, nationally and internationally
ILO 10	Skill (General)	Actively contributing in the learning process and discussion
ILO 11	Skill (General)	Demonstrating good capability to be independent and to work in team as to identify and analyse problems.
ILO 12	Skill (Specific)	Capability to ethically design and perform experiments, analyze and interpret data as to provide sustainable problem solving in Animal Science
ILO 13	Skill (Specific)	Capability to implement technology in Animal Science to increase productivity, efficiency, quality and sustainability based on breeding, nutrition, processing, management as well as to organize an entrepreneurship concept and a sustainable production system

The following curriculum is presented:

Semester 1

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Religious	2	0	90.67	0.00	3.40	0.00	3.40
Civic and Pancasila	3	0	136.00	0.00	5.10	0.00	5.10
Indonesia Language	2	0	90.67	0.00	3.40	0.00	3.40
English Language	2	1	90.67	42.50	3.40	1.70	5.10
Biology	2	1	90.67	42.50	3.40	1.70	5.10
Basic Managemen	2	0	90.67	0.00	3.40	0.00	3.40
Rural Sociology	2	0	90.67	0.00	3.40	0.00	3.40
Biochemistry	2	1	90.67	42.50	3.40	1.70	5.10
Sum	17	3	770.6666667	127.5	28.90	5.10	34.00

Semester 2

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Microbiology	2	1	90.67	42.50	3.40	1.70	5.10
Anatomy and Animal physiology	2	2	90.67	85.00	3.40	3.19	6.59
Registration and Regulations of Animal Industry	2	0	90.67	0.00	3.40	0.00	3.40
Instrumentation and Analysis Techniques Laboratory	2	1	90.67	42.50	3.40	1.70	5.10
Genetics	2	0	90.67	0.00	3.40	0.00	3.40
Animal Nutrition and Feed Stuff	3	1	136.00	42.50	5.10	1.70	6.80
Animal behavior	2	1	90.67	42.50	3.40	1.70	5.10
Forage Sciences	2	1	90.67	42.50	3.40	1.70	5.10
Sum	17	7	770.67	297.50	28.90	11.69	40.59

Semester 3

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Ruminant Nutrition	2	1	90.67	42.50	3.40	1.70	5.10
Non-Ruminant Nutrition	2	1	90.67	42.50	3.40	1.70	5.10
Meat Production	2	1	90.67	42.50	3.40	1.70	5.10
Dairy Production	2	1	90.67	42.50	3.40	1.70	5.10
Poultry Production	2	1	90.67	42.50	3.40	1.70	5.10
Miscellaneous Animal Production	2	1	90.67	42.50	3.40	1.70	5.10
Animal Reproductio	2	1	90.67	42.50	3.40	1.70	5.10
Basic Technology of Animal Products	2	1	90.67	42.50	3.40	1.70	5.10
Sum	16	8	725.33	340.00	27.20	13.60	40.80

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Semester 4

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Applied Statistics and Experimental Design	2	1	90.67	42.50	3.40	1.70	5.10
Research Methodology and Scientific Writing	2	1	90.67	42.50	3.40	1.70	5.10
Science and Technology of Feed Stuff	2	1	90.67	42.50	3.40	1.70	5.10
Extensions	2	1	90.67	42.50	3.40	1.70	5.10
Livestock Production Economics	2	1	90.67	42.50	3.40	1.70	5.10
Integrated Farming Systems	2	1	90.67	42.50	3.40	1.70	5.10
Reproduction and Artificial Insemination Management	2	1	90.67	42.50	3.40	1.70	5.10
Animal Product Handling	2	1	90.67	42.50	3.40	1.70	5.10
Sum	16	8	725.33	340.00	27.20	13.60	40.80

Semester 5

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Animal Product Technology	2	1	90.67	42.50	3.40	1.70	5.10
Ruminants Production Management	1	1	45.33	42.50	1.70	1.70	3.40
Non-ruminant production Management	1	1	45.33	42.50	1.70	1.70	3.40
Quality Control and Assurance	2	1	90.67	42.50	3.40	1.70	5.10
Animal Breeding	2	1	90.67	42.50	3.40	1.70	5.10
Animal Product Marketing	2	1	90.67	42.50	3.40	1.70	5.10
Agribusiness Management	2	1	90.67	42.50	3.40	1.70	5.10
Entrepreneurship	2	1	90.67	42.50	3.40	1.70	5.10
Sum	14	8	634.67	340.00	23.80	13.60	37.40

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Semester 6

Subject	Course	Practical	TOTAL HOURS		ECTS		Total
			Course	Practical	Course	Practical	
Epidemiology	2	1	90.67	42.50	3.40	1.70	5.10
Animal Breeding Management	2	0	90.67	0.00	3.40	0.00	3.40
Animal Feed industry	2	1	90.67	42.50	3.40	1.70	5.10
Farm Waster Management	2	1	90.67	42.50	3.40	1.70	5.10
Elective subject 1	2	1	90.67	42.50	3.40	1.70	5.10
Elective subject 2	2	1	90.67	42.50	3.40	1.70	5.10
Elective subject 3	2	1	90.67	42.50	3.40	1.70	5.10
Sum	14	6	634.67	255.00	23.80	10.20	34.00

Semester 7-8

Subject	SCU	TOTAL HOURS	ECTS	Total
Field Paractice	4	181.33	6.80	6.80
Thesis	6	272.00	10.20	10.20
Sum	10	453.33	17.00	17.00