



**ASIIN Seal**

**Accreditation Report**

**Bachelor's Degree Programme**  
***Biology***

**Master's Degree Programme**  
***Biotechnology***

Provided by the  
**University Jember**

Version: 23 June 2023

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## A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the names	Labels applied for <sup>1</sup>	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) <sup>2</sup>
<b>Program Studi Sarjana Biologi</b>	Bachelor in Biology	ASIIN	The Board of National Accreditation for Higher Education (BAN-PT) No. 13711/SK/BAN-PT/Ak-PPJ/S/XII/2021 valid until 27-12-2026	10
<b>Program Studi Magister Bioteknologi</b>	Master in Biotechnology	ASIIN	BAN-PTBAN PT No. 1812/SK/BAN-T/Ak/M/V/2019 valid until 28-05-2024	10
<b>Date of the contract:</b> 14.02.2022				
<b>Submission of the final version of the self-assessment report:</b> 06.10.2022				
<b>Date of the audit:</b> 12.12.2022 – 16.12.2022				
<b>Experts:</b> Prof. Dr. Friedhelm Meinhardt, University Muenster				

<sup>1</sup> ASIIN Seal for degree programmes

<sup>2</sup> TC: Technical Committee for the following subject areas: TC 10 - Life Sciences

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<b>Responsible decision-making committee:</b> ASIIN Accreditation Commission	
<b>Criteria used:</b>  European Standards and Guidelines as of May 15, 2015  ASIIN General Criteria, as of December 10, 2015  Subject Specific Supplementary Notes of the Technical Committee 10 – Life Sciences, as of 28 June 2019	

## B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF <sup>3</sup>	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Undergraduate programme in Biology	Sarjana Sains / Bachelor of Science in Biology	-	6	Full time	no	8 Semester	144 SKS / 217.44 ECTS	2001
Master programme in Biotechnology	Magister Sains / Master of Science in Biotechnology	Agricultural Biotechnology Medical Biotechnology	7	Full time	no	4 Semester	39 SKS / 58.89 ECTS	2016

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<sup>3</sup> EQF = The European Qualifications Framework for lifelong learning

The experts take note of the institutional framework conditions, under which the two programmes under review are offered:

The University Jember (UNEJ) has been established on 10 November 1964 by Ministerial Decree as a non-profit public higher education institution. It is located on the island of East Java in the urban setting of city of Jember, which has a population of around 2,600,000-inhabitants. UNEJ has been officially accredited and recognized by the Indonesian Ministry of Research, Technology and Higher Education.

UNEJ is a large coeducational higher education institution with a student population of around 18000 students, 97% are enrolled in undergraduate programmes and around 3% in postgraduate programmes. It employs around 1000 Staff, practically all of them of national origin. UNEJ has a selective admission policy based on entrance examinations, which is described in subsequent part of this report. International applicants are eligible to apply for enrollment. In terms of national and international rankings, UNEJ is ranked 19<sup>th</sup> among 582 Indonesian Higher Education Institutions in the national Indonesian Rankings, on position 2024 in world rankings.

The University offers a broad range of courses and programmes leading to officially recognized higher education degrees including pre-bachelor degrees (i.e. certificates, diplomas, and associate or foundation degrees), bachelor degrees (13 programmes), master degrees (14 programmes) and doctorate degrees (4 programmes) in altogether 15 faculties. Starting with 5 faculties at the time of its founding, this number has expanded and today includes 15 faculties in law, dentistry, pharmacy, agriculture, agricultural technology, computer science, social and political sciences, economics and business, humanities, public health, engineering, nursing, technology, as well as in mathematics and natural sciences.

The Faculty of Mathematics and Science with its around 1600 students and 37 teaching staff gives home to 4 study programmes, next to an undergraduate programme in physics and chemistry the two study programmes under review for an ASIIN accreditation, namely the Bachelor of Biology as well as the Master in Biotechnology. The Bachelor programme has been on offer since 2001, the Master programme since 2016.

The **Bachelor programme in Biology** is a full-time programme with a duration of 8 semester and 217 ECTS. It has a maximum annual intake of 90 students; currently the average enrollment amounts to approximately 80 students. As regards the Master in Biotechnology, it is a full-time programme with a duration of 4 Semesters and 59 ECTS. It has an enrollment of 10-15 students annually.

The two programmes are presented with the following profile in UNEJ’s Self-Assessment Report:

The **Bachelor in Biology** accordingly “focuses on basic biological science in the management of tropical biological resources with environmentally sound and globally competitive. Tropical biodiversity, which is the object of study in the Bachelor in Biology Study Programme, is expected to increase students understanding of living things in the tropics. Students, who study the concepts of structure, process, diversity of living things and the continuity of systems, which are further deepened at the molecular and cell levels, physiology, genetics, structure and development, biosystematics and evolution as well as ecology, are able to internalize the important value of the existence of other living things for human life. Humans are creatures that have a high dependence on other living things. However, human activities tend to overexploit other living creatures because of their anthropocentric nature. By mastering the correct knowledge about biology and the environment of living things, students are able to internalize a bio-centric view. This view puts forward good ethics when interacting with and solving problems of living things and their environment wisely, and prioritizes an eco-centric view in managing living things and their environment so as to ensure its sustainability throughout the ages which in the end can guarantee the welfare of humans, present and future generations.”

The **Master in Biotechnology** focuses on biological engineering for agriculture and medicine/ health biotechnology. It is a multidisciplinary educational offering, bringing together the scientific fields of Agricultural Biotechnology, Health Biotechnology and Bioprocesses and biomaterials.

UNEJ has formulated the following **Vision and Mission Statements** for the two programmes under review:

<b>Ba Biology</b>	<b>Ma Biotechnology</b>
<b>Vision</b>	
Providing excellence in bioscience for the management of tropical biological resources while being environmentally sound and globally competitive.	Becoming a leading and excellent Master of Biotechnology in agricultural and health biotechnology recognized nationally and internationally with the orientation to the development of agroindustry that is beneficial for academics, society and the working world.
<b>Mission</b>	

## B Characteristics of the Degree Programmes

<ol style="list-style-type: none"> <li>1. To organize a globally competitive bioscience learning oriented environmentally characterized by careful management of tropical biological resources;</li> <li>2. To carry out bioscience research oriented towards the management of tropical biological resources that are innovative and productive with an environmental perspective.</li> <li>3. To organize community service based on research results in the field of biosciences oriented to the management of tropical biological resources with an environmental perspective</li> <li>4. To improving cooperation in education, research and service to the community at national and international levels.</li> </ol>	<ol style="list-style-type: none"> <li>1. To organize the management of the Master in agricultural and health Biotechnology with professionalism and accountability.</li> <li>2. To offer a Master in agricultural and health Biotechnology in accordance with international standards and the development of science and technology.</li> <li>3. To develop basic or applied research oriented to the growth of agro-industrial biotechnology through exploration, modelling and biological engineering.</li> </ol>
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Finally yet importantly, the Self-Assessment Report also contains a summary of programme learning outcomes summarized in the table below:

<b>Ba Biology</b>	<b>Ma Biotechnology</b>
<p>Bachelor Graduates</p> <ol style="list-style-type: none"> <li>1. Are excellent and ethical in applying bioscience in their quest to become bio-entrepreneurs; they are able to solve problems related to the management of tropical biological resources with an environmental perspective;</li> <li>2. responsive and adaptive to the development of science and technology</li> </ol>	<p>Master Graduates</p> <ol style="list-style-type: none"> <li>1. Have the character, quality as well as biotechnological competencies with agroindustry-minded;</li> <li>2. Able to produce qualified research products in the form of scientific publications, patents, or commercial products and benefit the public interest;</li> </ol>

## B Characteristics of the Degree Programmes

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<p>3. able to apply a professional, independent, collaborative, communicative and responsible work culture and able to cultivate a leadership spirit in the work environment and society</p> <p>4. able to continue their education to a higher level in the field of biology and other related fields</p>	<p>3. Able to develop collaborations in education and research at the national and international levels.</p>
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The vision and mission statements as well as the Programme Learning Outcomes of both study programme have been widely published and are accessible on the study programme website as well as in a number of documents such as the student handbooks for the programmes under review. The evaluation of the vision achievement is regularly conducted every four years for Ba Biology and two years for Ma Biotechnology

UNEJ is using international accreditation as a means of self-improvement and instrument to promote its standing in the national and international HE community.

## C Accreditation Report for the ASIIN Seal

### 1. The Degree Programme: Concept, content & implementation

<b>Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)</b>
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**Evidence:**

- Self-Assessment Report
- Ba Biology: <https://unej.id/visionmissionbiology>
- Ma Biotechnology: <https://unej.id/visionmissionbiotechnology>
- Matrix matching Programme and Module Learning Outcomes
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

The ***Bachelor programme in Biology*** is a full-time programme with a duration of 8 semester and 217 ECTS. According to the information provided, it has been introduced more than 20 years ago as response to the manifold global humanitarian and ecological challenges especially in the field of environmental conservation. Apart from this international perspective, the programme also aims as fostering the growth of local expertise in environmental protection.

The underlying Programme Learning Outcomes (PLOs) according to UNEJ's Self-Assessment Report have been developed in a broad stakeholder process including the Heads of Departments in collaboration with the academic staff as well as industrial partners and student representatives, taking into account new exigencies of the National Indonesian Biology Curriculum Policy. It also has been referenced - according to the universities own account - against the level seven indicators of the Indonesian National Qualification Framework. All graduates accordingly are capable of

- applying their field of expertise and utilize knowledge, technology, and/or art in their field in solving problems and being able to adapt to the situation at hand

- mastering the theoretical concepts of a particular field of knowledge in general and concepts theoretical part of a special section in the field of knowledge in- depth, as well as being able to formulate procedural problem solving
- making the right decisions based on information and data analysis and to provide guidance in choosing various alternative solutions independently and in groups
- assuming responsibility for the achievement of organizational work.

Apart from this very generic list of graduate attributes, the **Faculty of Mathematics and Natural Sciences has used the ASIIN Subject-Specific Criteria of the Technical Committee “Life Sciences” as a point of reference.** These field specific criteria of ASIIN have been instrumental in providing the below matrix, which lists attitudes, level of knowledge as well as general and disciplinary skills for the **Bachelor of Biology graduates.**

<b>Attitude</b>			
PLO1	able to <b>internalize</b> norms and ethics based on Pancasila in working independently or in groups	1.a	<b>showing</b> an honest attitude and responsibility as the practice of Pancasila
		1.b	<b>working</b> individually or in team works
<b>Knowledge</b>			
PLO2	able to <b>analyze</b> the principles of biology, mathematics, and other relevant natural sciences	2.a	<b>analyzing</b> the basic concepts of biology, mathematics, other relevant natural sciences
		2.b	<b>correlating</b> the basic concepts of science (physics, chemistry, mathematics) with the principles of biology
PLO3	Able to <b>analyze</b> the principles of molecular biology, cells, organisms and management of tropical biological resources.	3.a	<b>Describing</b> the principles of molecular biology, cells and organisms
		3.b	<b>analyzing</b> biological principles that are relevant to the

			problem of biological resources management in tropics
<b>General skills</b>			
PLO4	able to <b>implement</b> scientific methods for the biological resources management and commercial products development in tropics	4.a	<b>implementing</b> scientific methods for the management of biological resources in tropics
		4.b	<b>demonstrating</b> scientific methods for development of commercial products from the tropical natural resources
PLO5	able to <b>implement</b> the logic of critical thinking on biosafety and environmental issues related to the field of biology with a scientific and bioethical approach	5.a	<b>implementing</b> the logic of critical thinking on biosafety related to the field of biology with a bioethics approach for better environmental awareness
		5.b	<b>using</b> the logic of critical thinking on environmental issues related to the field of biology with a scientific and bioethics approach
<b>Special skills</b>			
PLO6	able to do laboratory work and/or in the field independently and/or in groups for biological concepts implementation	6.a	<b>practicing</b> laboratory and/or field works independently and in groups
		6.b	<b>using</b> software applications and/or basic instruments for sampling and analysis in biology and environmental fields

PLO7	able to <b>employ</b> bioscience in solving problems related to biological resources in tropics and to <b>communicate</b> the results.	7.a	<b>integrating</b> bioscience in problems solving related to the management of biological resources in tropics
		7.b	<b>presenting</b> the results of problems solving related to the management of biological resources in tropics

Finally, the Faculty also presents a matrix, matching the defined programme learning outcomes with the learning outcomes of the individual module learning outcomes.

Concerning the process of regularly updating the programme learning outcomes as well as content, the Faculty of Mathematics and Natural Sciences has established a curriculum review committee, which organizes the discussions with important stakeholder form within and outside the university. This includes full-scale departmental meetings attended by all lecturers and the integration of feedback of students, alumni and professional organizations such as the Indonesian Biology Consortium (IBC), of which the BA programme has become a part of since 2016. This process has resulted in the launching of a modernized curriculum starting with the academic year 2021-2022 with updated vision and mission statements as well as programme learning objectives.

External stimuli for adapting the curriculum have been recent government regulations that require universities to implement a certain type of curriculum in line with the national qualification framework (INQF) as well as the requests by the afore-mentioned Indonesian Biology Consortium (IBC). The geographical position of UNEJ in the East Java region, being surrounded by four national parks and unique ecosystems, also exercises a strong impact. In response to the issuance of Ministry of Education No. 3 of 2020 concerning National Standards for Higher Education and Regulation of the Rector of the University of Jember No 13532/UN25/EP/2020 concerning freedom of learning at the University of Jember, the following adaptations have materialized:

The so-called “Independent Learning – Independent Campus” programme (ILIC – further explained in subsequent parts of this report) has been added in the curriculum as well as instruments such as Student Assignment Plans (SAP), Student Worksheet (SW), Rubric Assessment, and the assessment of Programme Learning Outcome (PLO) achievement every semester, which had not existed before..

The curriculum has further been rearranged in order for the body of knowledge of biology to be completed at the end of the fifth semester and the teaching and learning methodology is said to now include more elements of project based learning and case studies. The programme coordinators also mention, that the programme has been benchmarked against the programmes of major Indonesian competitors. In addition, the programme benefits by UNEJ's international network collaboration with universities abroad such as Japan (Osaka University and Hiroshima University), and Korea (Gyongsang National University and Kyungpook National University).

As regards the **Master programme in Biotechnology**, it has been on offer since 2016. As a multidisciplinary educational offering, it provides scientific expertise in the area of Agricultural Biotechnology, Health Biotechnology and Bioprocesses and biomaterials. In its Self-Assessment Report, UNEJ first matches the PLOs of Master in Biotechnology against level 8 of the Indonesian National Qualifications Framework (KKNI), which request all graduates to be

1. Able to develop sciences, technology, and/or art within the fields or professional practices through research, to produce innovative and proven work;
2. Able to solve the problems in sciences, technology, and/or art within the fields through interdisciplinary and multidisciplinary approaches;
3. Able to manage research and development that benefits society and knowledge, also to get recognition, nationally and internationally.

In analogy to the exercise conducted for the undergraduate programme, the Faculty matches the PLOs of Master of Biotechnology against the Subject-Specific Criteria of the Technical Committee (SSC) 10- ASIIN. Accordingly, every graduate of Master of Biotechnology is challenge to demonstrate compliance with the list of learning outcomes below:

No	PLOs	Code	Indicators
<b>Attitude</b>			
PLO1	Able to <b>internalize</b> an attitude of piety to God Almighty and love their country	1A	<b>Showing</b> responsibility, honesty, and discipline as the manifestation of piety to God Almighty
		1B	<b>Showing</b> a caring attitude towards the preservation of Indonesian culture and biodiversity as the embodiment of an attitude of loving the country.
<b>Knowledge</b>			

PLO2	Able to <b>develop</b> the biotechnological principles and other relevant sciences	2A	<b>Analyzing</b> principles of biotechnology and other sciences related to the agro-industrial problems
		2B	<b>Evaluating</b> principles of biotechnology and other relevant sciences for solving the agro-industrial problems
<b>General Skills</b>			
PLO3	Able to <b>demonstrate</b> the ability to collaborate and to communicate well in verbal and in writing national and/or internationally	3A	<b>Showing</b> collaborative skill during the learning process
		3B	<b>Demonstrating</b> communication skills both in verbal and in writing nationally and/or internationally
<b>Specific Skills</b>			
PLO4	Able to <b>modify</b> skills and knowledge of DNA and	4A	<b>Applying</b> the skills and knowledge of DNA and protein-based biotechnology
	protein-based biotechnology to produce innovative and useful biological products for agro-industrial sectors	4B	<b>Evaluating</b> innovative and useful biological products for agro-industrial sectors
		4C	<b>Producing</b> innovative and useful biological products for agro-industrial sectors
PLO5	Able to <b>manage</b> biotechnology research comprehensively with a multidisciplinary approach to solve problems in agro-industrial sectors.	5A	<b>Analyzing</b> the agro-industrial problems
		5B	<b>Applying</b> biotechnological methods through a multidisciplinary approach to solve agro-industrial problems
		5C	<b>Conducting</b> advanced research to solve agro-industrial problems
		5D	<b>Determining</b> solutions for Agro-industrial problems

As regards the aspect of curriculum revision, the Master programme in Biotechnology has been evaluated in 2020 in an effort to shorten the graduation time of students, to react to new demands on the part of needs of professional associations and other stakeholder, to respond to ministerial regulations regarding outcome based education (OBE). In addition, the inputs from alumni and graduates were used.

In reconstructing the curriculum, several revisions were carried out. This included compressing the personal development courses from twelve to seven, increasing the quality of case method and problem based learning methods applications, formatting new module handouts, also incorporating the “Independent Learning- Independent Campus”- concept

into the curriculum, supporting materials such as lesson plans, syllabus, lecture contracts, student worksheets, student work plans, portfolios and rubrics assessment.

### Employability

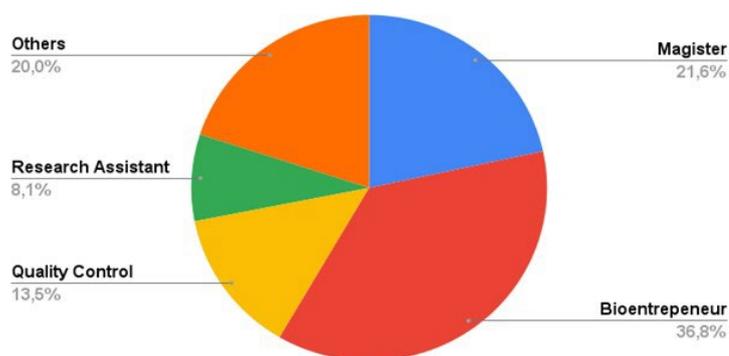
As regards the issue of employability, UNEJ has developed graduate profiles and conducted a tracer study for the graduates *of the Bachelor of biology student cohorts*, which completed their undergraduate studies between 2016-2021.

The following graduate profiles apply: Graduates of the Bachelor in Biology are expected to be able to find suitable positions as a) research assistants in the fields of biology and the environment; b) quality control staff; c) bio-entrepreneurs. A further specification of the graduate profile is provided in the table below:

The Graduate Profile	Description
1. Research assistants in the fields of biology and the environment	A professional whose job is to assist research work in the biological and environmental fields under the supervision of senior staff
2. Quality control staff	A professional that is responsible for controlling food quality so that product quality meets standards or controls the quality of industrial waste to meet quality standards.
3. Bio-entrepreneur	Entrepreneurs who work on tropical biological resource processing whose products are marketable, so they can earn profits.

In terms of procedure, this study has been implemented through the Graduates Group for the Bachelor in Biology Study Programme via a questionnaire. In this survey, questions were presented, which related to the suitability of graduates' profession with the competencies obtained from their study, first and current salary, the duration required to obtain a job, and the essential competencies for their profession, which have not been trained during their study.

The tracer study in 2020 presented that 85% of graduates had a waiting period for a job of no more than 6 months. A total of 80% of alumni's job profiles were reportedly related to the predefined study profiles, namely researcher's assistant (8.1%), quality control staff (13.5%), master studies (21.6%) and bio entrepreneurs (36.8%) (Figure 6.6).



In the survey, graduates nevertheless identified a number of areas for improvement. Some of the interviewees stressed the need for a more practical underpinning of the curriculum and the integration of internships at collaborating industries and institutions. Graduates, following the profile of becoming a teacher, suggested the inclusion of more practical teaching experience during their studies to support their profession. An intensified need to focus on ICT skills was also recorded.

As regards the **Master of Biotechnology Programme**, the Faculty also has defined three different **Graduate Profiles**. Graduates accordingly are supposed to work either as “Educators who can develop biotechnology through research, and transfer it to students”. A second profile are “Researchers who can manage and develop comprehensive research to solve biotechnological problems and to produce output that benefits society”. Finally, the programme aspires to education “Entrepreneurs who can apply biotechnology principles to manage biological resources in agroindustry with environmental insight.

In spite of the short lifetime of the programme, the Faculty has conducted a tracer study in 2020 on the whereabouts of its first graduates, altogether 30 alumni. In terms of distribution of graduate profiles, it turned out that 30% of graduates assumed jobs as researchers and worked in the private sector, 16.67% as lecturers, 10% as teachers and 10% in others job with 3.33% person reporting an unemployed status. Regarding the competence of graduates, the survey responses revealed that the alumni of Master in Biotechnology reportedly disposed of good competencies, but requested a further upgrade of the programme in terms of English language, computer as well as negotiation skills.

**In their assessment of this criterion, the ASIIN expert team comes to the following conclusions:**

The experts find that there is a “raison d’être” for both programmes under review. In terms of a documented rationale, the background for the Bachelor programme has however been much more convincingly stated in relevant documents (student handbook, curricula descriptions etc.) than for the Master programme. For the latter, the experts recommend

further specifying for stakeholders, what the added benefits for the graduate programme in biotechnology are and in what aspect the programme differs from the Master in Biology, which is also on offer at UNEJ. This in their eyes will also be instrumental in increasing the demand and the enrollment number for this graduate programme (also for the Bachelor students in the undergraduate study programme), which is currently too low.

Programme Learning Outcomes for both programmes have been designed by taking into account the exigencies of the Indonesian National Qualification Framework, the provisions of the National Indonesian Biology Curriculum and using the instrument of internal and external benchmarking with national competitors and international partners. The experts commend the Faculty of Mathematics and Natural Sciences for investing considerable effort in aligning the programme learning outcomes to the disciplinary requirements of ASIIN's Technical Committee for Life Sciences, also providing a matrix, matching programme and module learning outcomes in the process. In addition, the expert group finds evidence, that major stakeholders are regularly involved in the continuous assessment and further development of the programme learning objectives.

The experts appreciate that the Faculty has developed Graduate Profiles for both programmes and for conducting tracer studies following up on the success for its graduates on the labor market. They find the programmes "con grano salis" to be aligned to the needs of the Indonesian and regional labor market. The programme, according to the evidence provided, prepares the graduates for suitable positions in the Indonesian labor market, allowing them to take up an occupation corresponding to their education. Further proof in that regard is provided through the expert's discussions with representatives from the employer side.

The experts nevertheless consider the profile of an entrepreneur not to be suitably matched by the programme content, as there is only one module in each programme. They recommend further substantiating this specific profile by appropriate courses in entrepreneurship. Entrepreneurship in their opinion requires a multi-level project plan (including financial, environmental, ethical and social aspects), but also backed up by a comprehensive scientific plan. For the MSc in Biotechnology, group management could be a topic to facilitate entrepreneurship.

A similar finding is reached regarding the "profile of a researcher" in both the Bachelor as well as the Master programme. In spite of the fact, that the strength of the faculty is in the area of agriculture and health, the research profile, especially, but not only in the Biotechnology programme, does not clearly match such expertise, a Master of Science in Biotechnology is as of now not a research group leader according to an international standard.

The experts before this background recommend strengthening and sharpening the profile by adjusting the content and methodology of respective courses (such as Microbiology or Research Methodology) with respect to agriculture and health.

The experts attest that the learning outcomes of the two programmes under review correspond to level six and level seven of the European Qualification Framework and the Dublin Descriptors respectively. The programmes in their view satisfy the requirements of the ASIIN Subject Specific Supplementary Notes of its Technical Committee for Life Sciences.

### Criterion 1.2 Name of the degree programme

**Evidence:**

- Self-Assessment Report
- Discussion during the audit
- Diploma and Diploma supplement

**Preliminary assessment and analysis of the peers:**

The title for the undergraduate degree of Ba Biology is Sarjana Sains (S.Si) or Bachelor of Science. The title for the postgraduate degree of Ma Biotechnology is Magister Bioteknologi (M. Biotek.) or Master of Biotechnology. The titles of these two degree programmes follow the rules for naming study programmes under the regulation of the Minister of Research, Technology and Higher Education Number 59/2018 concerning Diplomas, Competency Certificates, Professional Certificates, Degrees, and Procedures for Writing Degrees in Universities.

The experts confirm that the English translation and the original Indonesian names correspond to the intended aims and learning outcomes as well as the main course language.

### Criterion 1.3 Curriculum

**Evidence:**

- Self-Assessment Report
- Curricular overview of the study programmes under review
- Module handbooks of the study programmes under review
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

The **undergraduate programme in Biology** is offered as a 4-year programme, upon completion of which graduates are awarded a Bachelor of Science degree (BSc). To earn a BSc degree, students need to fulfil university, faculty, and department requirements completing 144 UNEJ credits (corresponding to 217.44 ECTS).

As part of its documentation for the accreditation visit, the university presents the following **curricular structure**:

In the **first two semesters**, each disposing of 30 ECTS, students are primarily enrolled in basic science courses. In semester 1, they acquire basic competences in General Physics, Basic Chemistry, Calculus, Fundamentals in Biology as well as courses in English language and religion. The second semester features basic courses in Microbiology, Plant and Animal Structure, Cell Biology, Biochemistry as well as Civic Education as part of the compulsory Indonesian curriculum.

In the **third and fourth semester**, also encompassing 30 ECTS, students are said to broaden and deepen their knowledge. In the third semester, they are familiarized with subject areas such as Introduction to Environmental Science, Microbial Physiology Plant Development, Animal Development, Terrestrial Ecology, Genetics, Biostatistics and Bioethics. As part of the aforementioned compulsory Indonesian national curriculum students also enroll in Pancasila education, familiarizing students with the core values of Indonesian society. The fourth semester features a further systemization of student's skills by introducing educational offerings in Molecular Biology, Plant Systematic, Animal Systematic, Aquatic Ecology, Bioinformatics, Microtechnique, Evolution, as well as Biology Conservation.

With the third year, the process of specialization kicks in and the overall number of credits points per semester start to shrink. In the fifth semester, each students is requested to take elective courses in a magnitude of eight ECTS. This is supplemented by further specialized courses such as Introduction to Entrepreneurship, Occupational Safety and Health, Plant Physiology, Animal Physiology, Environmental Science, Tissue Culture as well as Biology Conservation. In the sixth semester of the Bachelor programme in Biology, there are no longer compulsory courses apart from the Introduction into Research Methodologies as part of the preparation for the Bachelor thesis in the final year. Students now can freely choose from a broad range of Elective Courses, the composition of which is further discussed below. The seventh and eight semester are devoted to community service and the elaboration of the final thesis.

**Electives**

As mentioned above, students, who are enrolled in advanced semesters (they have to be in their third year of studies to be eligible) of the Bachelor in biology programme, can

choose among a wide variety of different educational offerings, which are grouped in altogether five different “**Research Groups**”:

In the **Microbiology-Research Group**, electives are offered on topics such as Mycology, Food Microbiology, Health Microbiology, Enzymology, Industrial Microbiology, Virology, Microbiological Analysis Techniques as well as Bioconversion

In the **Botany Research Group**, electives in the area of Ethnobotany, Ornamental Plant, Bryology, Natural Medicine, Phytohormones, Plant Ecophysiology and Orchidology are on offer.

In the **Zoology Research Group**, students can select among courses in Animals Reproduction, Parasitology, Animal Behavior, Entomology, Endocrinology, Immunology as well as Human Physiology.

**The Ecology Research Group** features courses in Biogeography, Ecotourism, Valuation of Biological Resources, Environmental Biomonitoring, Tropical Forest Ecology, Mangrove Ecology, Bio-invasion Ecology, Phytoremediation, Coastal Area as well as Wildlife Management.

In the **Biotechnology Research Group**, the department of biology has assembled courses in Forensic Biology, Industrial Biotechnology, Plant Biotechnology, Health Biotechnology, Molecular as well as Population Genetics.

Another important feature for the programmes has been the introduction of the Independent Learning-Independent Campus (ILIC) Programme two years ago. It has introduced eight forms of learning activities including student exchange, internships/work practices, teaching assistance in educational institutions, research activities, the conduct of humanitarian projects, entrepreneurial activities, independent studies/projects as well as Village Development/Thematic Student Study Service.

The respective forms of learning activities of the ILIC can be organized by the Faculty of Mathematics and Natural Sciences through cooperation agreements or Memoranda of Understanding with partners or programmes offered and organized by the Indonesian Ministry of Education, Culture, Research, Technology and Higher Education. Students before registering at one of the activities are required to consult with an academic advisory lecturer and get approval from the study programme coordinator. The maximum lecture load that can be converted with learning activities carried out through the “ILIC”-Programme is 20 credits; the execution depends on each student’s initiative.

The entire structure of this Bachelor curriculum under review is depicted in UNEJ’s student handbook and its curricular overview and can be found in the annex to this report.

As regards the curricular structure *of the Master programme in Biotechnology*, the general distribution of courses is as follows:

Code	Type of modules	Credit	ECTS
PBU	General compulsory	20 (51.3%)	30.2
PBT/PBK	Specific compulsory	6 (15.38%)	9.06
PBP	Elective Courses	4 (10.52%)	6.04
PBU	Final Project	9 (23.07%)	13.59
<b>Total</b>		<b>39</b>	<b>58.89</b>

Within the programmes, students can choose between two specializations namely ***Agricultural Biotechnology and Medical Biotechnology*** (a third one in “Bioprocesses and bio-materials” is also mentioned in some documents, but it not fully covered by the curriculum; in that sense the experts recommend focusing on the other two specializations):

The Master of Biotechnology Study Programme has established two corresponding research groups: the **Agricultural Biotechnology Research Group** focuses on developing research with topics for plant growth and production as a source of food, energy, and health raw materials in order to improve human welfare. The studies developed are related to the study of ecology, biochemistry, biotechnology, molecular biology, and plant physiology. In addition, research is also carried out through bioprocess studies.

The **Health Biotechnology Research Group** is a research group that focuses on nutraceutical, pharmaceutical, and biotechnology studies related to the health sector. Research studies developed for example are studies of active ingredient compounds for health, studies of tropical diseases, traditional medicinal ingredients, and studies of food sources for health.

**Starting in the first semester**, which features 22.6 ECTS; all Master of Biotechnology students are jointly introduced into the Principles of Biotechnology, Biochemistry and Molecular Biology, Genetic Engineering and Bioinformatics and are required to take a course in Research Methodology.

For those **specializing in Agricultural Biotechnology**, there are obliged to enroll additionally in the courses Plant-Microbe Interactions, Molecular Plant Physiology, Biosynthesis of Primary and Secondary Metabolites, Biochemical Product Engineering as well as Molecular Detection in Agriculture.

**For those specializing in Medical Biotechnology**, the obligatory courses are Gene Therapy, Biopharmaceutical Innovation, Molecular Immunology as well as Molecular Detection in Medicine.

This is followed by a **second semester** of also 22,6 ECTS, in which all students are trained in Cell Propagation, Bioprocess Engineering, Regulation of Genetic Engineering Product, Entrepreneurship in Biotechnology as well as Biostatistics. Next to these compulsory courses, student have to select the equivalency of six ECTS among an extensive list of Elective Courses according to their respective research interests and area of specialization. This list features offers in Enzyme Engineering, Biotechnology in Plant Protection, Industrial Microbiology, Fermentation Technology on Enzyme Production, Bio-nanotechnology, Analysis of Biomolecules, Metabolic Engineering, Molecular Virology, Cancer Immunology, Technology on Molecular Diagnostics, Regenerative Medicine, Personalized Medicine as well as Biobanking according to their research interests.

The **third and fourth semester** are devoted to the students' elaboration of a final project/Master thesis, which is accompanied by supporting courses in scientific writing and dissemination of research. The final project can be taken through regular semester or internships, research project, thematic community service, independent study activities of MBKM programme. According to the student handbook, the third semester has a total student workload of 11 ECTS, whereas the last semester features three ECTS.

Students can take the final project or thesis exam, if they have completed all the compulsory courses set by the graduate programme, and published a qualified scientific paper with a minimum grade of D/a GPA of 3.00.

**In their assessment of the curricular structures of both programmes are review**, the experts find the **Bachelor curriculum** to be a well-rounded curriculum, which in their view adequately prepares students to achieve the intended learning outcomes. The expert team specifically commends the programme coordinators for providing a broad range of elective courses, which gives students many opportunities to specialize according to the research interests.

They see value in the educational approach equipping students in their early semesters with the capacity to analyze the principles of biology, cells, molecules, mathematics, and natural sciences and followed up in subsequent semesters by strengthening their ability to implement biological concepts and scientific methods as well as their critical and logical reasoning in the management of tropical biological resources. In the final semesters, the emphasis is put on their capacity to solve tropical biological problems. The experts also rate positively the individual developments possibilities for students under the Independent Learning – Independent Campus (ILIC) scheme largely depending on individual initiative.

The experts nevertheless identify the following areas for improvement in the curricular structure of the Bachelor programme:

The experts see a heightened need for the students to read and write scientific English at a satisfactory level and to familiarize students with biology specific vocabulary. The experts recommend offering courses in English and/or offer English students seminars and lectures.

Regarding the module handbook, there is a need to improve a certain number of module descriptions. This is the case for the module descriptions in basic physics and chemistry, which need to be completed and specified with regard to current methods and instruments. There should be an introduction into current methods (e.g. HPLC, spectroscopy) depending on available modern equipment. The experts also see an overlap between the modules Microbiology and Microbial Physiology, which should be cleared up. The description of the module Microbiology deals almost exclusively with observations, whereas growth curves, different media, fermentation, environmental conditions etc. are not mentioned. Since the module manual handed out to participants indicates that these topics are contained, the experts consider it a requirement refreshing and completing the respective module descriptions.

In their assessment of the **Master curriculum**, the experts identify the following areas of improvement:

The experts recommend focusing and arranging modules clearly along the topics of agriculture and health for strengthening agro-industrial and medical contents. At least the module descriptions (such as, but not only, Molecular Virology and Microbiology) must be more informative and specific to meet the requirements.

The experts also take up comments by stakeholder in the interviews that fermentation skills are lacking in the curriculum. This in their eyes should be added as content of the curriculum in appropriate modules. This finding also correlates with the fact, that there is only rather limited equipment for culturing microorganisms (exclusively available is one over-aged shaking incubator and no lab fermenter). For solving the capacity bottleneck in order to provide students with such indispensable knowledge and to address the aims of the curriculum, modern standard equipment (temperature controlled shaking incubators and lab fermenters) have to be available for teaching.

While most interviewees expressed their general satisfaction with respect to the level of knowledge and the skill set of the graduates, almost all criticized the students missing aptitude for teamwork. Thus, the experts recommend strengthening the aspect of group work in suitable courses.

## Internship

Within the **Bachelor programme in Biology**, an internship is not mandatory and not an integral part of the curriculum. It does not appear in the module handbook as a separate entity and there are no clear learning outcomes defined for this activity. Students thus far have been doing an internship at best on a voluntary basis during the summer vacation, usually for a short period of time without payment and without receiving credits for it.

The discussion related to internships also has to be seen in the context of the last graduate survey of October 2021. Here, the graduates do insist, that Internships in various industries as well as practical elements in a range of courses have been absent. The graduates voice many suggestions regarding the implemented curriculum to improve their employability. Those working as quality-control staff underline the need for additional material in practicum activities. Internships at institutions or industries need to be included in the curriculum. This is based on their first experience of engaging in a real-world profession where they need to adapt to their work and work environment. Internships are considered vital to introduce and bring students closer to the professional world. Graduates who work as teachers suggest the inclusion of microteaching to support their profession.

Since the curriculum reform for the academic year 2020-2021, the Faculty has reacted to these demands by incorporating the “Independent Learning Independent Campus” (ILIC) programme into the curriculum. Students can now choose among one of the eight forms of learning activities in the programme. Students can thus either take part in internships or alternatively research or independent studies of ILIC programme. For the teacher profile, the programme allows now for the inclusion of microteaching in the curriculum by doing teaching assistance in educational units in the ILIC programme on an independent campus. Students also can engage thematic community service. In the framework of the latter, students spend 45 days in a rural village in support of the rural population. Work programmes run by students must comply with the community's conditions and needs.

The Faculty in its Curriculum document also points to the possibility of internships/work practice under the authority of the Ministry of Education, Culture, Research, and Technology, organized by the National Research and Innovation Agency (BRIN) under a competition scheme. Students in this format can apply for this BRIN internship and on acceptance can get a limited amount of credits (around 3 ECTS).

As regards the **Master programme in Biotechnology**, an internship has also not been an integral part of the curriculum since its initiation in 2016. This however has changed since the academic year 2021/2022. As a result of the curricular reform procedure within the Faculty and in response to initiatives by industrial stakeholders, the internship became

mandatory for third-semester Master students. This new internship now offers the chance for students to spend an internship at collaborating industries and research institutions for a full semester.

In their assessment of the situation, the experts see the introduction of the ILIC programme and the BRIN initiative as first steps into the right direction. As regards the Bachelor programme, the experts are concerned by the way, the internship exercise is currently organized, as no clear rules and university regulations regarding the duration, support and framework conditions have been formulated. In the curriculum and course description, they also do not find the corresponding module nor a precise formulation of expected learning outcomes, but only a range of courses, which can be “converted” with a limited amount of around 3 credits.

For the Master programme, the implementation of an internship is a big step in the right direction. UNEJ is cooperating with a number of partner such as the Balitjestro institutions, KR Purwodadi, Meru Betiri National Park the National Research and Innovation Agency (BRIN) as well as the Indonesian Coffee and Cocoa Research Institute (ICCRI). With the latter, the Faculty has defined the first example of an agreement regarding the framework conditions of a more permanent internship arrangement.

Irrespective of these developments, there is a definite need for further defining the procedural guidelines for providing and doing an internship. A formal module description with appropriate learning outcomes and ECTS calculation is also warranted. Neither in the student handbook, nor in module handbook nor in the credit point summary is there a precise definition of an internship including its duration. The “conversion” of a range of courses with 3 ECTS, as described in the Curriculum handbook, in the experts’ eyes, is not a transparent system, the amount of credits attached to these “converted internships” not sufficient.

These findings are confirmed during the interviews with various stakeholder groups. The interviewed students are neither happy with the quantity nor quality of available internships. They clearly are in favor of getting a more profound contact with their future employers through a more structured form of internship. The latter also appreciate a longer internship period to get to know their prospective employees better.

The experts suggest that the Internship in the Bachelor programme becomes an obligatory, formal, integral part of the curriculum. They see value in providing a clear guidance about internship opportunities and better defining its relevance to thesis and future career of the students.

### ***International Mobility***

As part of its Self-Assessment Report, the Faculty for Mathematics and Natural Sciences describes a set of measures and instrument to foster internationalization among students in the reviewed programmes. The programme coordinators point to the introduction of a small number of English classes in both programmes. In Ma Biotechnology, some courses are currently taught in English due to the cooperation with lecturers from Flensburg University of Applied Sciences (FUAS). The English classes are supported by handbook modules and lecture materials as well as learning activities in English.

In terms of **outgoing mobility**, the Bachelor programme entertains a small number of partnerships with international universities, in the framework of which students can study abroad. In the academic year 2019-2020, three students conducted research activities at Biberach University and Flensburg University of Applied Sciences (FUAS), Germany. The following year, 12 students took part in (national) student exchanges at both Universitas Jenderal Soedirman and the Universitas Surabaya. This appears to be an essential step to improve collaboration between universities. Until recently such collaborations were extremely rare. In 2021-2022, the ILIC programme had a first major impact, as altogether 68 students took part in the “Independent Campus – Independent Learning” student exchange (as well as in the alternatives internship, teaching assistance, and independent study). Among those students, four students participated in the Student Exchange at FUAS. The experts also learn, that the Ministry of Research, Technology and Higher Education Indonesia 2022 has started to implements an international mobility programme for undergraduate students, named IISMA, in order to increase the number of students’ participation in international mobility. The information of this programme reportedly is communicated to interested students by the international office; lectures are called upon to motivate and guide potential student

In spite of these departures, the number of outgoing students in both programmes currently is small, as evidenced by the subsequent table, provided by the Faculty:

**Total number of Student mobility from 2019 to 2021**

Student Mobility	Year		
	2019/2020	2020/2021	2021/2022
Student Exchange	3	12	23
Internship	0	0	40
Teaching Assistance	0	0	5
Independent Study	0	0	10

As regards the **Master in Biotechnology**, there are also a small number of exchange programmes in place. From the odd semester of 2019 to the even semester of 2022, Ma Biotechnology sent two students each semester for research and sit-in class activities to the Prefectural University of Hiroshima (Japan), Gyongsang National University (South Korea), and FUAS (Germany).

UNEJ has produced and published an international student handbook providing students from abroad with the necessary background information regarding student life and studying experience. Incoming Student Mobility is nevertheless currently very low.

The experts conclude that incoming as well as outgoing mobility should be further fostered, though some progress is made concerning mobility within Indonesia. Furthermore, many of the stays abroad are quite short and most of them are restricted to South-East Asia (with the notable exception of the German partnerships). There are some functioning partnerships in place, in the framework of which exchange to a limited degree can be witnessed. As the experts do not detect problems concerning the organisation of student mobility and credit transfer, they suspect that a widening of the opportunities for the students and a focused advertisement may be helpful. Outgoing activities are due to activities of individual lecturers/professors who apply for external funding. The university should encourage and support such activities e.g. by giving career points for successful lecturers/professors.

Some efforts undertaken by the university such as the publication of a very detailed international student handbook have the potential to reap benefits in the future. Ministerial policies at the national level in support of student mobility also will bear fruit in the future.

All things considered, the experts recommend that UNEJ and the Faculty for Mathematics and Natural Sciences consider the implementation of new strategies to foster student mobility. This would be of vital importance for students to improve their English proficiency, to get to know other educational systems, and to enhance their job opportunities.

<b>Criterion 1.4 Admission requirements</b>
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**Evidence:**

- Self-Assessment Report
- Academic Guidelines
- International student's guidebook
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

Admission and selection of prospective students are clearly regulated at UNEJ. The admission system is based on the Rector's Regulation of UNEJ Number 293/2019 concerning Amendments to the Rector's Regulation Number 12341/2013 about Student Admission of UNEJ. The admission requirements are published on the universities website, announced on social media and printed as leaflets distributed to high schools in Jember and its surrounding cities.

Admissions for the undergraduate and graduate programme are organized in various ways as exemplified in the subsequent table:

No.	Selection pathway	Input Qualification	Selection Mechanism
1	SNMPTN (National Selection for State University Admission)	Senior High School or equivalent	Based on the report score, UN score, and another achievement
2	SBMPTN (Joint Selection for State University Admission)	Senior High School or equivalent	Written test and CBT
3	SBMPTBR (Joint Selection for University Admission in the Besuki Raya Area)	Senior High School or equivalent	Written Test
4	ADIK (Affirmation of Higher Education)	Senior High School or equivalent	National Selection
5	Transfer	3 years Diploma	Administrative and Interview
6	PMA (Admission for International Students)	Special requirement	Administrative
7	SPMBPS (Graduate's Programme Admission)	Bachelor or Master	Academic and English Proficiency

Prospective students for the **Bachelor of Biology programme** can thus apply through the

1. National Selection of Higher Education or University (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), a national admission system based on the academic performance during high school.

2. Joint Selection of Higher Education or University (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide written test checking qualifications in subject areas such as mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography.
3. Joint Selection for University Admission in the Besuki Raya Area (SBMPTBR): similar to SBMPTN, students from the Besuki Raya area are selected based on a written test.
4. Affirmation of Higher Education (ADIK): programme that supports graduates of high schools in Papua, West Papua and other remote areas as well as disadvantaged regions to continue studies in higher education.
5. Finally, there is an additional pathway by articulation from a 3-year diploma programme as well as a separate admission system for international students.

As regards the **Master programme in Biotechnology**, a special Graduate's Programme admission called SPMBPS applies. Eligible applicants accordingly are graduates from the undergraduate education level (S1 or D4) that have an academic performance record with a minimum cumulative achievement index (GPA) of 2.75 for those with "A" accreditation, 3.00 for "B" accreditation, and 3.25 for "C" accreditation. They have to pass the TPA (Academic Potential Test) selection with a minimum score of 450 and TKBI (English Language Proficiency Test) with a minimum score of 475. Furthermore, they have to submit a legalised copy of the diploma and academic transcripts and have a letter of recommendation from two people who know the applicant's academic ability. Finally, they are requested to submit a letter of motivation and study plan as well as a health certificate from a certified doctor. Candidates, who are already working, have to present a permit letter from their employer. The procedure for master's admission is provided at <https://unej.id/RegistrationProcedure>. Successful applications have to pay for the privilege to study at UNEJ. The tuition fee for the programmes are determined by the Ministry of Finance based on a proposal from UNEJ. There are different levels for these fees, depending on the parents' income. For students from underprivileged families, there is no tuition fee. Furthermore, there are various options for scholarships that cover the tuition fees. The tuition fees for master's students amount to 7.8 million IDR for domestic and 15 million IDR for international students (this corresponds roughly to 450 and 900 EUR respectively).

In terms of numbers, the university determines the ratio of students admitted through these four ways. For the Bachelor of Biology programme, the maximum capacity is 90 students, the average student intake around 80 students annually. The number Master students amount to around 10-15 per year. Generally speaking, the number of applications is considerably higher than the number of admitted students. For the academic year 2020/21,

the ratio is between 1:... for the Bachelor in Biology degree programme, and 1: ,,for the Master in Biotechnology programme.

The experts find that (prospective) students are informed in detail about the requirements and the necessary steps to apply for admission into the programmes. The corresponding rules and regulation are binding and transparent and are based on decrees by the ministry of education and on the university's written regulations. The experts confirm that the admission requirements support the students in achieving the intended learning outcomes. This finding is also supported by the "drop-out"-statistics provided by the University, which demonstrate that most students graduate, while moderately exceeding the standard period of study.

The regulations also include rules for the recognition of qualifications achieved externally (e.g. at other higher education institutions or outside the higher education sector), which are clearly defined. UNJ facilitates the transition between higher education institutions and with non-university places of learning without jeopardizing the achievement of learning outcomes at the desired level).

As regards the low enrolment numbers for the Master programme, the experts in their interviews learn that a Master qualification is not always the most popular qualification for a student to apply for a job and for the Indonesian job market to absorb. They nevertheless believe that marketing efforts as well as funding opportunities need to be increased and that more should be done to convince UNEJ's own Bachelor students to continue their studies at their Alma Mater.

#### **Criterion 1.5 Workload and Credits**

##### **Evidence:**

- Self-assessment report
- Student handbook for both programmes
- Module handbooks for both programmes
- Survey of student satisfaction related to the workload
- Discussions during the audit

##### **Preliminary assessment and analysis of the peers:**

All the study programmes in UNEJ must abide by the rules of the credit system (SKS). Each credit is distributed between guided and independent learning activities, as well as between face-to-face activities, laboratory activities/practicum, and project and field studies. According to Regulation of the Ministry of Research, Technology and Higher Education No.

44 of the Year 2015, the learning activities used are lectures, responses, seminars, and practicum. One credit of lecture and practicum is equivalent to 170 minutes, with 50 minutes for a face-to-face meeting (online/offline), 60 minutes for structured assignments, and 60 minutes of self-study. In one semester, students must complete at least 75% of 16 weeks of meetings.

As regards the two programmes under review, the **Bachelor in Biology Study Programme** stipulates a minimum study load of 144 credits (corresponding to 217 ECTS) and a maximum of 160 credits (240 ECTS) in line with national requirements (Permendikbud No. 3 of 2020 concerning National Standards of Higher Education). The minimum load consists of 35 general compulsory courses, 74 credits of specific compulsory courses, 29 credits of elective courses and a Bachelor Thesis of 6 credits (9.06 ECTS). The maximum load with 160 credits involves 45 credits for elective courses in total.

The Faculty provides the results of extensive workload questionnaire and puts to the minutes, that most of the students (84.6%) expressed satisfaction with the arrangement of the modules and their work assignments; only a minority (16,9%) felt sometimes burdened. Around two-thirds of the students reportedly felt that their free time and study time were balanced and that the workload was in accordance with the definition of one credit. The Faculty also points to the fact, that the number of credits (workload) an individual student depends on the GPA they achieve. In this sense, a self-corrective mechanism is in place, which prohibits, that weaker students are overburdened and that supporting/corrective actions are launched.

Concerning the **Master in Biotechnology**, the total credits that must be completed for graduation amounts to 39 credits. The total credits for four semesters (or 2 years) are equivalent to 58.89 ECTS, consisting of General Compulsory modules of 20 credits (30.2 ECTS), Specific Compulsory modules of 6 credits (9.06 ECTS), Elective modules of 4 credits (6.04 ECTS), and Master Thesis of 9 credits (13.59 ECTS). Regular survey for measuring workload satisfaction of students reveals that a vast majority (97 %) with the module arrangement of the face-to-face meeting, practical work, self-study and project activities.

UNEJ also provides statistical data about the average length of studies and the number of dropouts. According to the data, the average study period of the students from the Bachelor in Biology amounts to 4.3 years and for the Master in Biotechnology 2.6 years. Additionally, they see that almost all students complete the degree programmes with low number of dropouts in the past years. The data verifies that both degree programmes under review can be successfully completed.

The experts are satisfied with the way the system of academic credits is administered by UNEJ and the Faculty of Mathematics and Natural Sciences for the Bachelor in Biology programme. They do however not understand the ECTS calculations for the Master programme, as the figures provided do not correspond to the standards span of 25-30 European credits per semester and ask the programme coordinator for clarification.

In their discussions with students and staff alike, they learn of no complaints, students are generally satisfied with the workload and the distribution of credits between the semesters. The recognition of credits for incoming and outgoing students is satisfactory and has been discussed in prior parts of this report, as has been the need to assign credits for a modernized form of internship for the programmes under review. The Module handbooks for both programmes clearly distinguish between credits given for various forms of supervised studies and self-study time.

#### **Criterion 1.6 Didactic and Teaching Methodology**

##### **Evidence:**

- Self-Assessment Report
- Module handbooks of the programmes under review
- Results of Staff Satisfaction
- Discussions during the audit

##### **Preliminary assessment and analysis of the peers:**

In its Self-Assessment Report, the faculty records that appropriate learning methods and instruments are implemented for both the Bachelor as well as the Master of Biotechnology programmes and that the variations in learning methods and instruments are adjusted to the level of knowledge, skills, and competencies that have been set in each module.

As an outcome of new government regulations and internal curricula adjustments, discussed in prior parts of this report, the use of problem-based and project-based learning methods has been intensified, supporting students in collecting and analyzing data, finding and solving problems as well as discussing and presenting research results both in the laboratory and in the field. The faculty also takes pride in emphasizing a student centered teaching mode, encouraging active participation of students in the form of interactive discussion, topic presentation, simulation, laboratory work, field work, case study, and projects. As supporting evidence, the faculty presents extensive data regarding the choice of teaching methods, which they have compiled in the SAR. For the Bachelor in Biology, it

records 32.64% interactive discussion, 17.77% Topic Presentation, 24.14% Laboratory/Field Work and 26.44% Project /Case Studies.

The programme coordinators for both programmes point to the information provided in the Module Handbooks, which clearly state the teaching methods applied in each learning unit and completed with practical instructions for laboratory work, learning materials, and the learning plan and assessment. All these learning instruments are managed in a learning management system (LMS) UNEJ (<https://mmp.unej.ac.id/>), which has been introduced by UNEJ in 2009 in order to monitor the teaching methodology that is applied and made accessible in the various course materials. According to the exigencies of the LMS System, each lecturer must upload his or her teaching materials and working procedures on LMS.

At the start of the Covid-19 pandemic, teaching at UNEJ quickly switched to online learning with video conferences, recorded videos and other media. All teaching and learning activities were entirely conducted online through the LMS, before reverting now to the status ante quo before the start of the Pandemic.

Remedial teaching in circumstances, where students fall behind. The lecturer in charge will provide several alternatives such as a second trial of exams, additional assignments, remedial learning, or peer tutoring to assist the student in catching up.

In the discussions with students, the experts learn that they are generally satisfied with the quality of teaching and learning in the two programmes under review. The student surveys in this field also clearly attest to this finding. There continues however to be a need to improve English language skills, including writing, listening, and reading. To solve this problem, most lecturers are expected to give teaching material, presentations, and assignments in English. Furthermore, students are expected to use the center for language to improve their conversation, writing, and grammar. Students also possibly improve their English skills by attending additional English courses at the Language Centre of UNEJ.

The development of critical thinking skills by means of student-centered learning remains a challenge. This finding is further supported by remarks of students, who are in favor of more challenging examination formats.

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

The experts find that the programme learning outcomes of the Bachelor in Biology as well as the Master of Biotechnology correspond to level 6 and 7 of the European Qualification

Framework and the Dublin Descriptors. As regards the Master programme, they see value in further specifying how this educational offer is different from the parallel Master programme in Biology and why it is beneficial to enroll. This would be instrumental in increasing the currently low student intake.

Whereas the two programmes are in principle aligned to the needs of the Indonesian labor market, there is a need in further substantiating and sharpening the graduate profiles in the curriculum. This applies particularly to the profile of the “entrepreneur” and the “researcher”, which are currently not sufficiently backed up by the curriculum.

The experts confirm that major stakeholders are regularly involved in the continuous assessment and further development of the programme. However, the experts suggest a regular meeting of relevant lecturers and industry stakeholders to implement fine-adjustments of the curriculum in order to improve the employability. The expert team also attests that the module/course descriptions include the learning outcomes of each individual learning unit. Whereas in general the curriculum and the underlying module descriptions are suitable, there is a need to improve on a number of courses and to get rid of some overlap in content. The experts also identify a need for students to better read and write scientific English at a satisfactory level and to familiarize students with biology specific vocabulary as specified above. In addition, the aspect of group work should be strengthened in both curricula and lecturers could participate in international (English) online lectures that will then be discussed in class.

The experts find that the Bachelor programme empowers its graduates to find suitable positions in national labor market and to take up an occupation corresponding to their education. They however suggest that for the Bachelor programme an internship becomes an obligatory, formal and integral part of the curriculum. They see value in providing a clear guidance regarding internship opportunities and better defining its relevance for the elaboration of a thesis and for the future career of graduates.

Process and Regulations are in place to organized student and staff mobility. In practical terms, incoming and outgoing mobility is very limited. The experts recommend that the Faculty designs new strategies to foster student mobility.

The expert panel considers the admission requirements and procedures for the two programmes under review as binding and transparently published on the webpage. Clear rules to ensure that students are in principle able to successfully graduate on time.

The expert panel considers the credit system to be-based on the students’ workload. The estimated workload is realistic and well founded, so that the study programmes can be completed in the standard period of study. The modules of each programmes are regularly

evaluated to whether the credits awarded for each module correspond to the actual student workload and whether the distribution of the workload across all semesters enables graduation within the standard period of study. As regards the Master of Biotechnology, the ECTS calculations are however deficient as they do not correspond to the usual European range of 25-30 ECTS per semesters, but are much lower for unknown reasons. The experts point out that there cannot be a fixed conversion rate between Indonesian SKS and ECTS points, but the students' total workload needs to be verified for each course separately. To this end, UNEJ should consult the ECTS User's Guide.

The experts acknowledge that the teaching staff applies a variety of teaching methods and didactic means to promote achieving the learning outcomes and support student-centered learning and teaching. The expert panel also confirms that the teaching methods are regularly reviewed in the process of evaluations at the end of each semester. They nevertheless recommend fostering the development of critical thinking skills.

The experts consider criterion 1 to be mostly fulfilled.

## 2. Exams: System, Concept and Organization

### Criterion 2 Exams: System, concept and organization

#### Evidence:

- Self-Assessment Report
- Examination regulations (<https://unej.id/RuleExamination>)
- Module descriptions
- Curriculum guidebook for all degree programmes
- Samples of student's work (projects, exams and thesis)
- Academic Guidelines and Academic Calendar

#### Preliminary assessment and analysis of the peers:

The Faculty presents the general rules for the examination and assessment systems applicable in both programmes under review. Exams in the Bachelor of Biology as well as the Master of Biotechnology follow the University's rules as stated in Academic Guideline (<https://unej.id/RuleExamination>). Exams and the corresponding assessment rubrics aspire to measure students' learning achievements (knowledge, skills and competences) according to a predefined grading scale reference. The grading scale is designed following the

Assessment Criteria Reference and converted into ten-grades , i.e. A ( $\geq 80$ ), AB (75-80), B (70-75), BC (65-70), C (60-65), CD (55-60), D (50-55), DE (45-50), and E ( $< 45$ ). The minimum score of course passing grade for a bachelor's degree is C (60-65), while the minimum score for the course, a passing grade for a Magister degree is B (70-75).

The module handbooks for both programmes under review contain the course learning outcomes as well as the type of examination, by which the attainment of these Learning Outcomes are to be measured. The Faculty reportedly uses a wide variety of assessment types including written, quizzes, tests, reports as well as practical lab assignments, project reports, presentations and oral exams. It is however up to each individual lecturer to determine which form of exams to implement.

At the first meeting, students are informed what is required to pass the respective module. The form and length of each exam is laid down in the course descriptions that are available to the students via the Universities' Integrated Information System (SISTER). It is common practice for the lecturers to give quizzes every two or three weeks, but there are generally no unscheduled tests. The students learn about mid-term and final exams via the Academic Calendar. The final grade of each module is calculated based on the score of these individual kinds of assessment. The exact formula is given in the module handbook. UNEJ uses a grading system with the grades A, AB, B, BC, C, CD, D, DE and E, where a C (equivalent to a Grade Point of 2) is necessary to pass a module.

Students must attend at least 75% of the total course sessions in order to take final exam. Academic regulations also foresee, that only students, who have attended all lab work activities, are eligible to obtain a practice examination permit. Students who fail to reach the minimum achievement criteria have to join the remedial programme – usually conducted in January-February of each year - to catch up and improve unsatisfactory results.

There are also regulations in place for students who cannot attend the examination due to health reasons or personal matters under institutional circumstances. Upon provision of necessary documents such as medical letters or approved institutional letters, they are eligible for make-up assessments. In case, students object to their exam results, they have the opportunity to appeal first directly with the concerned lecturer and subsequently through a university wide complaint system integrated with SISTER within a week after the final grade is announced. It is the prerogative of the Programme Coordinator as well as the Vice Director for academic affairs to make a final decision.

Special regulations are in place for the Bachelor and Master thesis: as regards the Bachelor thesis, every student is required to do a final thesis in the fourth year of studies. Prior to the actual research work, students are requested to write a research proposal and present it in a seminar attended by lecturers and other students who form a research group. The research proposal has to be accepted by the Dean and the supervisor committee who will

then appoint the research supervisors. Usually, there are two research supervisors for each student. One will assume the role of the principal supervisor and the other serve as co-supervisors. After completion of the Bachelor's thesis, the student has to present and defend the results in front of teachers and fellow students. To ensure the quality of the implementation of the final project, an assessment rubric provided by the Undergraduate Thesis Supervisory Commission (KOMBI). It is important to note, that Bachelor students will receive their thesis grades after fulfilling two requirements: uploading final thesis revision and proof of submitting related articles in public journals.

As regards the **Master thesis**, students are only eligible after fulfilling the minimum requirements of the compulsory courses, which all have to be passed with the minimum grade of B. Thesis assessments are managed by the Master's thesis advisory board (KOMBI). The assessment of the thesis is carried out in two stages, firstly the evaluation of the research proposals and secondly the evaluation of the final thesis report. Student research proposals are evaluated through seminars attended by at least ten student participants, two supervisors, and two examiners. At the final stage of the master thesis assessment, supervisors and examiners will examine the thesis based on the thesis examination rubric, focusing mainly on writing skills, presentation, scientific comprehension, understanding of the thesis, and related knowledge. After the final exam, the study programme provides a two-month time for students to undertake a thesis revision and correction if required by the examiner and their supervisor. A re-sit exam may be required for students who fail to achieve the minimum thesis examination result. The programme coordinators inform the experts, that the Ma Biotechnology on occasions collaborates with external university partners such as The Prefectural University of Hiroshima, Japan, to improve the quality of the thesis. The study programme coordinator will appoint a co-supervisor and examiner from the external University partner, who are requested to apply the same assessment instruments and complementary rubrics. The use of external examiners is implemented as a mechanism to guarantee quality expectations. As is the case for the Bachelor thesis, a Master student also is required to have at least one research article published in a reputable academic journal, before taking the final thesis exam.

UNEJ and the Faculty routinely apply a plagiarism check (e.g. Turnitin) on the Bachelor and Master thesis. Students who commit plagiarism will be given a sanction in the form of suspension for six months up to one year and have to redo the thesis. Students who commit plagiarism or other academic ethics violations on other forms of assignments and exams will be punished by grade reduction depending on the level of violation as stated in the student handbook or the student may even fail.

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

also confirm during the interviews that they are well informed about the examination schedule, the examination form and the rules for grading. They also have adequate time to prepare for the exams.

The experts in their interviews also discuss with 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 quizzes. The final grade is the sum of the sub exams. The students appreciate that there are several short exams instead of one big exam as this forces them to continuously study during the entire semester and not having to solely work for one final exam at the end of the semester.

The experts prior and during the visit have a chance to review a sample of theses work provided by the Faculty. They appreciate, that the duration of completing a thesis is incorporated in the final grade.

They equally find that while plagiarism, generally speaking, is rather a minor problem in Biosciences, in a number of examples provided to them, academic ethics are violated and scientific misconduct occurs. An example in case is the putative manipulation of experimental data and statistics, image processing without giving the tools etc. It is not clear to the experts how students are really guided through a thesis project, thereby avoiding these serious mistakes. What the experts are missing in some of the sample work provided, is a critical, scientific evaluation of the data; some of the material and methods used are not state-of-the-arts and they also find that there are insufficient figure legends and the terms of scientific writing needs to be improved, not only in terms of English proficiency. The experts in summary identify a significant lack in expert thesis supervision given that the deficits observed are not minor mistakes but a substantial lack of understanding how science is carried out (nature of science).

The experts see a necessity revising and upgrading the system of thesis preparation and supervision to assure that all student work in the future complies with a sufficient scientific standard in line with a Bachelor and Master qualification. It might be an idea setting up a collection of good BSc and MSc theses from other countries and use these in preparation seminars as examples (for discussion of the science and the formal set up of a thesis).

The experts also question the meaningfulness of publishing a Master and especially a Bachelor thesis in scientific journals. The required publication of the BSc thesis should be reconsidered. In Indonesia and internationally, a negligible fraction of BSc theses is publishable (if at all, it is a contribution to a larger project). The same is true to a lesser degree for a MSC thesis. In a majority of cases, an MSC thesis is not sufficient for a full-scale publication. The experts point to the fact, that after the peer-review, the student has no more time to improve the manuscript according to the reviewer's suggestions. "Publication-mania" leads

to a misconception of scientific papers. This results, even for established scientists, in publishing papers in (at best) national, in many cases even local journals of no significance. The experts before this background encourage the Faculty and UNEJ pursuing alternatively the already existing practice at UNEJ of using special student journals for the publication of student's work. This should be the routine rather than pursuing the goal of publishing in "pseudo-international journals".

Following up on suggestions from students themselves, the experts furthermore recommend offering more study case type of exam questions to stimulate student's critical thinking abilities.

To save time for students in the Ma Biotechnology, the experts recommend allowing students to graduate even if the required number for a graduation ceremony is not reached.

As regards the grading system, the experts in their review of a sample of exams find in some instances an obvious mismatch between the quality of the answers and the grades given. The experts at the same time learn that within a short period of time, the GPA for both programmes under review has increased significantly (from a GPA of below 3 to a remarkable 3.5). The experts question the motives for this raise in performance before the background, that the downgrading by the national QA agency BAN-PT to a "B category accreditation" was connected to not reaching the threshold of three plus, which constitutes the threshold for the best "A" accreditation. The experts recommend systematically establishing a system of external examiners in line with what is already done on the level of the Master thesis grading (see above).

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

The experts find that sound rules and transparent examination regulations are in place, they are clearly presented in the Academic regulations, in the examination rules and other documents. Assessment procedures are clearly communicated to students via the Universities' Integrated Information System (SISTER). Examination regulations are found to be fair and non-discriminatory, in-line with the LO and the teaching methods, with appropriate assessment rubrics defined.

The Faculty of Mathematics and Natural Sciences disposes of disciplinary procedures safeguarding academic integrity and guarding against the misuse of intellectual property in the conduct of examination. Plagiarism checks are taken seriously with every student's supervisor asked to attach a certificate to student work indicating the "plagiarism" ratio.

The number and distribution of exams ensure an adequate workload as well as sufficient time for preparation. In the discussion with the students, no concerns or problems are recorded.

The experts however see a need to revise and upgrade the system of thesis preparation and supervision by adequately qualified supervisors to assure that all student work in the future complies with a sufficient scientific standard in line with a Bachelor and Master qualification. The experts also recommend a systematic use of external examiners.

Instead of maintaining the requirement for Bachelor and Master students, to publish their thesis in national or international journals, the experts rather encourage the Faculty and UNEJ to pursue alternatively the venue of using special student journals for the publication of student's work.

The experts furthermore recommend offering more study case type of exam questions further stimulating student's critical thinking abilities.

To save time for students in the Ma Biotechnology, the experts recommend allowing students to graduate even if the required number for a graduation ceremony has not been reached.

The experts consider criterion 2 to be mostly fulfilled.

### 3. Resources

#### Criterion 3.1 Staff, Staff Development, and Student Support

##### Evidence:

- Self-assessment report
- Staff handbook
- Results of Staff Satisfaction
- <https://dean-of-students.tiu.edu.iq/career-center/>
- Discussions during the audit

##### Preliminary assessment and analysis of the peers:

##### HR Resources

As regards the Human Resources available for the Bachelor in Biology and the Master of Biotechnology, they according to the information provided by the Faculty are supported

by 23 and 18 teaching staff (lecturers), respectively. The minimum academic qualification for a lecturer in Ba Biology is a master's degree and a doctoral degree for teaching in the Ma Biotechnology.

Concerning the **academic qualification profile** of the teaching staff, around 40% of the lecturers in the Bachelor programme hold master's degrees and 60% doctoral degrees. The faculty leadership in the interview minute, that they are encouraging lectures to upgrade their academic qualifications by providing internal as well as external funding for scholarships to pursue doctoral studies. It also provides a long-term HR development plan until 2030 with ambitious target goals.

In terms of **staff positions** and the evidence provided in the staff handbook, there is one full professor (4.35%) as well as 6 associate professors (26.09%), 10 assistant professors (43.47%) and 6 lecturers (26.09%), who are in charge of teaching, research and student supervision. The promotion to a higher academic position is based on a number of factors such as the achievement in research activities, publications, academic education, supervision of students, and other supporting activities. In order to be promoted to the position of a full professor, the applicant must hold a PhD degree, lecturers who have master's degrees can be promoted to assistant professor or associate professors.

In its own SWOT analysis, UNEJ states, that in support of the Bachelor of Biology programme, the Faculty needs to increase the number of professors and associate professors by encouraging them to apply for the "Professorship Acceleration Research Grant " provided by the University Jember. The University according to its own account has also established so-called Forum Groups Discussion for lecturers who have not proceeded with academic position improvement for more than 5 years.

In terms of **staff-student ratios**, they are predefined by the Indonesian government through the regulation of the Ministry of Research, Technology and Higher Education. Accordingly, the ideal ratio of staff to active student numbers is 1:20 with a 50% tolerance rate. The current ratio in Ba Biology and Ma Biotechnology is 1:14 (for altogether 336 students) and 1:2 (for 38 students) respectively. The low number of students in the Master in Biotechnology programme is a concern to the Faculty. The leadership announces its intention to increase marketing efforts by promoting the degree to biotechnology-related undergraduate programmes, by undergoing international accreditation, and downgrading the requirements for student publication as a minimum requirement for graduation. No staff recruitment in Ma Biotechnology is foreseen in the upcoming years.

As for the Bachelor of Biology programme, the forecast of the Faculty foresees a declining staff-student ratio due to the age structure of its staff. The lecturer-to-student ratio

in Ba Biology is predicted to augment to 1:33 and further until 2030 due to imminent lecturer's retirements. The Faculty announces its intention for further recruitment starting in 2024. The experts also learn, how the recruitment process at UNEJ/the Faculty works: the wish for further recruitment is submitted to the Ministry of State Apparatus Utilization and Bureaucratic Reform to open the job vacancy for a lecturer position. The selection processes for job vacancies is co-organized by the ministry and the University Jember to select the most qualified candidates for lecturer positions in Ba Biology and Ma Biotechnology.

### **Job Conditions and Performance Review of Staff**

UNEJ has established three types of evaluation methods related to the job conditions and performance of its staff, namely lecturer performance targets (SKP), lecturer workload evaluations (BKD) as well as student surveys regarding their satisfaction with the teaching performance of individual lecturers. The evaluation via performance targets is conducted annually by the head of the study programme assessing the level of target achievement while taking as point of departure the plans each lecturer is requested to draw up at the beginning of the year. The workload-based evaluation is conducted once per semester based on the assessment of credit accumulations from teaching, research, and community service activities. Finally, students evaluate the lecturer's teaching quality by answering questionnaires through the on-line system SISTER.

Lecturers of Ba Biology and Ma Biotechnology conduct their **research projects** collaboratively in research groups, which have been presented in prior parts of this report. Most of the research projects in Ba Biology and Ma Biotechnology are supported by grants from the university, governments, private companies, and international institutions. The students of Ba Biology and Ma Biotechnology are reportedly involved in research activities in order to support the completion of their final projects. Some researchers are also involved in collaboration with other domestic and overseas universities as well as other institutions specifically for industry-related research. Lecturers are requested to disseminate their research results in national and international conferences and publish in reputable national and international journals. The University provides rewards for lecturers whose articles are published in reputable international journals.

### **HR Development**

As regards the **aspect of staff development**, a new national policy on the part of the Indonesian government is in place, which targets the improvement of the level of professionalism, integrity, moral, and competitiveness of lecturers. In the context of this compulsory support programme, all lecturers in both Ba Biology and Ma Biotechnology

have received tailor-made training in the further development of pedagogical skills depending on the level of expertise. The basic pedagogic "PEKERTI " training has been developed for junior lecturers and the advanced training "applied approach (AA)" for senior lecturers. These trainings are annually organized by the Institute for Learning Development and Quality Assurance (LP3M) of UNEJ. Other training offers target the improvement of teaching skills in the area of project-based team learning. Lecturers who have completed the PEKERTI training are entitled to apply for lecturer certification (*Sertifikasi Dosen*) which is the minimum standard quality for lecturers based on Government Regulations. Most of all lectures of Ba Biology and Ma Biotechnology programmes have been awarded these lecture certifications.

As regards the further professional development of young lecturers with a Master's qualification, they are encouraged to pursue doctoral study based on their research interests. Senior lecturers are obligated to mentor and train the newly recruited teaching staff for teaching, research and community service. To improve professional development, both study programmes support lecturers to participate in domestic and overseas training. They are reportedly also encouraged engaging in international staff exchange programmes in the area of research. Faculty members in the last five years lecturers have thus have been sent to higher education and other research institutions in countries like Germany, United States of America, France, United Kingdom, Japan, South Korea, Australia, and the Philippines (listed in the subsequent table), with whom UNEJ entertains M.O.U.s.

UNEJ provides as evidence the following table below, which contains the professional skills development of Ba Biology and Ma Biotechnology in the last five years

Pro-grammes	Visited Institution	Developments professional skill
Ba Biology	Meru Betiri National Park	collaborative research: biological resources and ecosystem management (6 persons)
	Alas Purwo National Park	collaborative research: biological resources and ecosystem management (4 persons)
	Flensburg University of Applied Sciences – Germany	collaborative research: capacity building (3 persons). Research methodology (3 persons)
	University of the Philippines Los Baños – Philippines	Scientific collaboration: Writing collaboration (book chapter) (2 persons)
	University of Nottingham - UK	Non Degree Training: Management study programme (1 person), collaborative research (1 person)

	Centre for ecological research (CER), Kyoto University - Japan	Academic visit: Management laboratory (5 persons)
	Universiti Teknologi Mara – Malaysia	Staff mobility: capacity building (2), collaborative research (1 person)
	Groningen University – Netherlands	Networking: Scientific capacity building (1 person)
Ma Biotechnology	Flensburg University of Applied Sciences – Germany	Visiting researcher: biotechnology skills (3 persons)
	Leibniz Institute of Plant Biochemistry - Germany	Visiting researcher: research skills in metabolomic (1 person)
	United States Department of Agriculture – US	Scientific capability under research collaboration: Molecular Plant Microbe Interaction (1 person)
	University of Minnesota – US	Scientific capability under research collaboration (1 person)
	Michigan State University - US	Capacity building: Biotechnology Regulation (1 person)
	Institut de Recherche pour le Développement – French	Capacity building: Research Skill on Genome Editing (1 person)
	University of Nottingham - UK	Management skill: Centre of Excellence for Biotechnology (3 persons)
	Hiroshima University – Japan	Visiting researcher: Research skills in molecular biotechnology (1 person)
	Hyogo University – Japan	Visiting researcher: Research skills in metabolomic (1 person)
	Gyeongsang National University - South Korea	Visiting researcher: Research skills in molecular biotechnology (3 persons)
	Kyungpook National University - South Korea	Visiting researcher: Research skills in Bio Material (1 person), molecular biotechnology (2 persons)

It is reported, that all of the lecturers in both Ba Biology and Ma Biotechnology have fulfilled the requirement of 12-16 credits per semester for further training.

### Support and assistance for students

The University and the Faculty have implemented a series of instruments supporting students in the learning process and monitoring their success in reaching academic the assigned learning outcomes of both programmes.

The Faculty has at its disposal a university-wide Integrated Information System “SISTER” to monitor students' academic progress, checking academic achievement including GPA per semester, cumulative GPA and percentage of achievement (PP) or approving and changing student plans and course programmes. **For the Bachelor in Biology** programme, the monitoring of student achievement is carried out three times during their studies at UNEJ. Firstly, this is done in the first year (2nd semester), then in the second year (4th semester), and finally in the last semester. Academic advisors, who on average are looking after 16 students and are requested to meet with them at least four times per semester, are in charge of using the data, generated by SISTER, to provide assistance to students, consulting them on their study plans, which courses to take and what to do in case of academic problems. The study programme on a regular basis also appoints provides a supervisor as well as a co-supervisor supporting students in writing the thesis. Monitoring and evaluation of the implementation of the bachelor thesis is the responsibility of the Bachelor Thesis Supervisory Commission (KOMBI) with the aim of accelerating student graduation.

As regards the **Master in Biotechnology**, an academic supervisor, looking on average after 2-3 students, accompanies, monitors, provides advice and direction for students. At the beginning and end of each semester, he/she will meet with students to discuss academic matters, including course evaluation and planning. In addition, at the beginning of the 2nd semester, students who have met the requirements for conducting thesis research will be assigned two thesis supervisors in accordance with the Standard Procedure of the Thesis Supervisory Commission (KOMBI). The Commission together with the supervisors will regularly evaluate the progress of completing the final project/thesis.

The Bachelor in Biology programme under review is supported by the Biology Alumni Association, which consists of around 300 alumni. Activities that take place in this group include sharing job vacancies, sharing scholarships for study/college, sharing alumni work experiences, and sharing college experiences for alumni who are continuing their studies.

As regards other support services of UNEJ/Faculty, such as psychological support, health services, financial assistance etc., students are generally happy with the level of support they receive.

In their appreciation of this criterion, the experts come to the following conclusions:

Regarding the quantity and qualification level of the staff working in the Faculty the number of staff especially in the ranks of full time professor is not high, but in the expert's eyes

currently sufficient to implement the two programmes under review. The high number of Master graduates teaching in the Bachelor of Biology programme however remains a concern to the experts while acknowledging, that professional development plans are under way further upgrading the lecturer qualifications. They nevertheless recommend speeding up this process to safeguard the necessary qualification level for the undergraduate programme. In addition, it would be useful to hire more graduates from other universities. As regards the Master programme, the quantity and quality of staff is sufficient before the background that currently only few students enroll, dropping to one digit numbers in the past years during the Corona crisis. The stipulation of the Faculty not to hire new staff for the Master programme in the foreseeable future will eventually have to be reevaluated, if the announced increase in marketing efforts bears fruit. The experts also stress the importance of recruiting more guest lecturers, as most staff are recruited from among UNEJ's own graduates to look over the edge in scientific exchanges.

The expert team equally takes note of the evidence provided and attest to the fact, that available survey results show a high level of satisfaction among the most important stakeholders. Teaching staff are generally content with their working environment and professional development chances, during the interviews, they exhibit a strong commitment to their Alma Mater. As regards the students, they are equally satisfied with the teaching performance at the Faculty as well as with their learning environment.

Lecturer in the discussions with the expert team confirm that a range of options for professional development are available to them. The experts acknowledge that various opportunities for continuous professional development are provided. There is a mandatory educational training for new academic staff that encompasses curriculum design, teaching material, and innovative teaching and learning methods. Moreover, at the beginning of each semester workshops are held to refresh and to deepen didactic competences by the Institute for Learning Development and Quality Assurance. The experts nevertheless take note of the fact, that teaching staff at the department would nevertheless appreciate more tailor-made professional development courses to assist them in writing adequate research papers to place them in indexed journals or successfully applying for international research projects.

In terms of the overall system of evaluation of teaching and research promotion as well as career advancement, the experts understand the current system is based on an institutionally implemented mix of support and control with little room for personalized development. The experts see value in institutionalizing more individual short and mid-term development plans for each individual staff member.

In conclusion, the expert panel recognizes a strong identification of the teaching staff with their institution. The composition, professional orientation and qualification of the teaching staff are sufficient for successfully delivering the degree programmes under review.

### Criterion 3.2 Funds and equipment

#### Evidence:

- Self-Assessment Report
- Discussions during the audit

#### Preliminary assessment and analysis of the peers:

The university and the faculty are mainly funded by the Indonesian government, through tuition fees as well as grants for research projects. The government covers 40% of the budget; state funding is mostly used to cover salaries and expenses. An additional 50% are generated by tuition fees. The student tuition fees amount to 2,500,000 IDR/student/year on average or 1,038,156,000 IDR/year in total for Ba Biology, about 7,500,000 IDR/student/semester for Ma Biotechnology. Grants contribute around 10% to the total budget; they can be applied through government and non-government organizations/institutions for building construction, research and teaching projects, student and staff exchange, community engagements, and equipment procurement. UNEJ has a centralized funding scheme, meaning that there is a possibility to cross-subsidize study programmes with little enrolment, as is the case for the Master in Biotechnology programme. The financial management of UNEJ is executed through a Budget Management Information System (by the name of SIMANAGA).

Students in the Ba Biology and Ma Biotechnology study programmes use classrooms equipped with LCDs and AC, seminar rooms, integrated library, herbarium, insectarium, animal care units, greenhouses, botanical parks, the Agrotechnopark, international certified laboratory, and libraries and some facilities from the institution partners. Every student and lecturer is provided free access to Wi-Fi connection in all areas at UNEJ. As regards the laboratories, they according to the programme coordinators are equipped with essential analytical instruments for biotechnology and biology research including manual procedures and logbooks. The analysis instruments are regularly calibrated and the usages are monitored in the logbook. Laboratories are also equipped with technicians to assist students and lecturers to conduct teaching, learning, and research activities in the laboratories. Laboratories are also equipped with emergency equipment such as a safety shower, eye washer, portable fire extinguisher, etc. The Faculty in its own SWOT analysis has identified a shortage of equipment for the more numerous students

in the Ba in Biology programme. To solve this problem, Ba Biology arranges classes that are conducted in different time schedules so that the number of students per class is reduced resulting in an increased ratio of equipment and student number. Moreover, Ba Biology is also implementing resource sharing with CDAST and the Faculty of Pharmacy to use some analytical instruments.

The central library has been accredited "A" by the National Library Accreditation Board. It is also equipped with an Online Public Access Catalogue to serve ordering and borrowing books and the online service for preservation and distribution of scholarly research on the digital material format. The library also subscribes to international and national accredited journals and bulletins from various scientific databases.

The figures presented by the university indicate that the faculty's income is stable and the funding of the degree programmes is secured. The academic staff in the interviews with the expert voice the opinion, that the two programmes under review receive sufficient funding for teaching and learning activities. The students confirm this positive impression and state their satisfaction with the available resources. The experts see however value in the proposition, that a budget exclusively at the disposition of the faculty/department should be institutionalized, thereby strengthening its autonomy and capacity to make even small investments according to its own need. The expert also recommend investing in the further diversification of the income sources of the faculty/department outside of tuition fees (third party funding, provision of paid continuous education courses/short cycle programmes).

Regarding the laboratories and equipment, the faculty in principle has adequate laboratory equipment. There is however only rather limited equipment for culturing microorganisms. The experts see a need for the procurement of at least one large shaking incubator and a lab fermenter.

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

The experts find that sufficient financial means are available to secure the funding of the two programs under review. They nevertheless recommend that the university provides (even a small) budget exclusively at the disposition of the faculty/department, thereby strengthening its autonomy and to invest in the further diversification of the income sources of the faculty/department outside of tuition fees (third party funding, provision of paid continuous education courses/short cycle programs

As regards the physical infrastructure, it is equally adequate to accommodate for the needs of students and teaching staff. The experts conclude that the faculty in principle disposes

of sufficient laboratory equipment, but request that the equipment for culturing microorganisms is upgraded.

The experts point out that UNEJ should be more open to hiring staff members that have not graduated from UNEJ. Students should not study at one university and then become lecturers at the same university. In contrast, new staff members, before becoming a lecturer, should spend some time at a different university.

The experts consider criterion 3 to be mostly fulfilled.

## 4. Transparency and documentation

### Criterion 4.1 Module descriptions

**Evidence:**

- Self-Assessment Report
- Homepage of the programmes
- Student handbook
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

The module handbooks for all three programmes have been published on UNEJ's website and are thus accessible to the students as well as to all stakeholders. The experts observe that they contain information about the persons responsible for each module, the teaching methods and workload, the credit points awarded, the intended learning outcomes, the examination requirements, the forms of assessment and details explaining how the final grade is calculated.

While generally appreciating the quality of the module handbooks, the experts identify the need to improve on certain module descriptions, which have been already identified in prior parts of this report.

### Criterion 4.2 Diploma and Diploma Supplement

**Evidence:**

- Self-Assessment Report
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

According to the information provided by the Faculty, students of the **Bachelor of Biology** programme upon graduation receive three documents, a diploma certificate, as well as an academic transcript containing the final marks of all the modules and thirdly also a Diploma Supplement. The issuance of diploma certificates is the authority of the university and is signed by the Rector and Dean/ Director, while the academic transcript, containing the final marks of all modules and the Diploma Supplement is signed by the Dean/ Director. Graduates of **Master programme in Biotechnology** receive only two documents, a diploma certificate and academic transcript at the graduation ceremony, but not Diploma Supplement. All the documents are printed in both English and Indonesian.

The ASIIN experts are provided with samples of these documents. They experts confirm that the students of both programmes under review are awarded a Diploma Certificate as well as a Transcript of Records. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA. As to the Diploma Supplement, no such document is available for the graduates of the Master in Biotechnology, which needs to be corrected in order to comply with the ASIIN requirements.

<b>Criterion 4.3 Relevant rules</b>
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**Evidence:**

- Self-Assessment Report
- Academic Guidelines for Diploma, Bachelor and post-graduate programmes”
- International Student handbook
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

UNEJ rules and regulations are comprehensively documented in the “Academic Guidelines for Diploma, Bachelor and post-graduate programmes”, which has been published by the university and contain information on all parts of a student’s life cycle. All incoming students get this academic handbook containing their rights and duties during their stay at the university. During the compulsory orientation programme organized by the Faculty of Mathematics and Natural Sciences, students of the Ba Biology programme are familiarized with these Academic Guidelines. For the Ma in Biotechnology programme, it is the Graduate School, which is in charge of this task.

The orientation programme covers the regulation of provisions for general affairs, students, curriculum structure, lectures, completion of the study, and study leave, academic facilities, evaluation of learning achievement, academic norms, transfer of study programmes, graduation criteria, higher education transfer, the continuation of study, and academic administration and sanctions. The information is presented in both English and Indonesian. The University of Jember in addition also has developed rules for disability-friendly education services. They comprise standards for academic services for students with disabilities, the standard for facilities and infrastructure, the standard for learning, and the standard for administration. International Students obtain all necessary information in a comprehensive International Student handbook. The academic and student affairs divisions in the Faculty of Mathematics and Natural Sciences for Ba Biology and Graduate school for Ma Biotechnology also have the responsibilities of managing and maintaining the rights and duties of students, as well as lecturers and educators.

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

The experts confirm that the rights and duties of both UNEJ and the students are clearly defined and binding. All rules and regulations are published on the university's website in 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.

The experts confirm that UNEJ has submitted a sample Diploma Supplement for the Master's programme together with its statement on the draft report. The Diploma Supplement includes all necessary information and will be handed out to every graduate.

The experts consider criterion 4 to be mostly fulfilled.

## 5. Quality management: quality assessment and development

<b>Criterion 5 Quality management: quality assessment and development</b>
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**Evidence:**

- Self-Assessment Report
- Quality Assurance Policy of UNEJ
- Questionnaire and the results of the Student Feedback Survey

- Results of Staff Satisfaction
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**

UNEJ and the Faculty of Mathematics and Natural Sciences present a comprehensive system of external as well as internal QA, which have been institutionalized over the course of many years in line with ministerial regulations.

External Quality Assurance exercises of UNEJ and the Faculty are related to the legal obligation to submit every degree programme for accreditation to the national Indonesian Accreditation Agency (BAN-PT) in addition to the compulsory institutional accreditation. The two programmes under review have received the second highest accreditation status (B) from BAN-PT. The downgrading was mainly due to the access in the standard period of study as well as falling below the threshold of 3 in the GPA average of students (which in the eyes of the expert is a controversial and even counterproductive measurement to integrate in the assessment, see their comments under criterion 2: examination system). In addition to these national procedures, international accreditation (such as this procedure by ASIIN) is done on a voluntary basis in UNEJ's quest to become internationally recognized and to improve its standing in international rankings.

UNEJ in addition has established a comprehensive system of Internal QA:

All study programmes are systematically subjected to thorough internal screening processes using the instrument of student, alumni and employer surveys in the process. Students provide their feedback on the curriculum by filling out the questionnaire online. The course evaluations are conducted at the end of each semester before the final grades are made public. The questionnaires are developed by the course survey committee and include questions with respect to the course in general and about the teachers' performance. In the discussion, students are of the opinion that their comments are taken into consideration. This becomes apparent in the constant curricular revision process that is performed under participation of students and industry partners. The industry representatives confirm in the discussion that the university is eager to receive feedback about new developments and trends and the employability of their graduates. The Faculty is conducting regular tracer studies, which document the success of students on the labour market and using the feedback for the further improvement of both programmes.

The experts find, that internal feedback loops the results of the course evaluations are centrally assessed and analysed before they are communicated to the Head of Department, who is in charge of initiating any measures if problems or needs for improvement have been detected. A summary of the results is made accessible to the students. An example in

case is the satisfaction of the students with staff members. If the rating of an individual lecturer is low, the Heads of Department will contact the respective teacher, discuss the issue and propose solutions. If no improvement can be achieved over a longer period, the staff member will be dismissed. Thus, the experts agree that the quality management circles at UNEJ are well established and work under participation of all stakeholders.

The Faculty has also executed a SWOT analysis in order to cope with self-perceived weaknesses, to expand on the strengths and to capitalizing on the opportunities of the programme. Another cornerstone of UNEJ's and the faculties IQA system is the implementation of an outcome based curriculum and the diversification of teaching methods focused on student centered learning.

In addition, the University regularly conducts an evaluation of achieved learning outcomes in both programmes under review. Evaluation for PLO achievement is performed at the end of the semester.

Overall, the expert panel has a positive impression of the quality assurance system for the programmes under review. They consider UNEJ and the Faculty to conduct a sufficient number of evaluations to survey the opinion of students, stakeholders, and staff on a regular basis. The results of these processes are incorporated into the continuous development of the programmes under review. The results and any measures derived from the various quality assurance instruments used (various survey formats, student statistics, etc.) are communicated to the students and other stakeholder.

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

The expert panel commends UNEJ for institutionalizing a comprehensive and mature quality assurance system with multiple external and internal components.

The engagement of external accreditation agencies further demonstrates the high commitment of TIU leadership for continuous improvement. This equally applies to UNEJ's multi-faceted Internal Quality Assurance systems, which the experts find to be of high quality and suitable to providing feedback for the further development of the program and adequately monitoring student progression.

The experts consider criterion 5 to be fulfilled.

## D Additional Documents

No additional documents are needed.

## E Comment of the Higher Education Institution (28.04.2023)

UNEJ provides the following statement:

### 1. The Degree Program: Concept, content & implementation

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

##### a) Page 12, 1<sup>st</sup> Paragraph (both programs)

**ASIIN:** *In addition, the programs benefit by UNEJ's international network collaboration with universities abroad such as Germany (University Kassel), Japan (Osaka University and Hiroshima University), and Korea (Gyeongsang National University and Kyungpook National University).*

##### **Comment/response:**

The programs benefit by UNEJ's international network collaboration with universities abroad such as **Germany (LMU, FUAS, Tubingen, and Biberach)**, Japan (Osaka University, Prefectural University of Hiroshima, Shizuoka University, and Hiroshima University), **Netherland (Groningen)**, **USA (Minnesota University)**, and Korea (Gyeongsang National University and Kyungpook National University).

##### b) Employability

##### ● Page 14, last sentence (Ba. Biology):

**ASIIN:** *A total of 80% of alumni's job profiles were reportedly related to the predefined study profiles, namely researcher's assistant (8.1%), quality control staff (13.5%), **magister (21.6%)** and bio entrepreneurs (36.8%) (Figure 6.6). what is here exactly the meaning of "magister"?*

##### **Comment/response:**

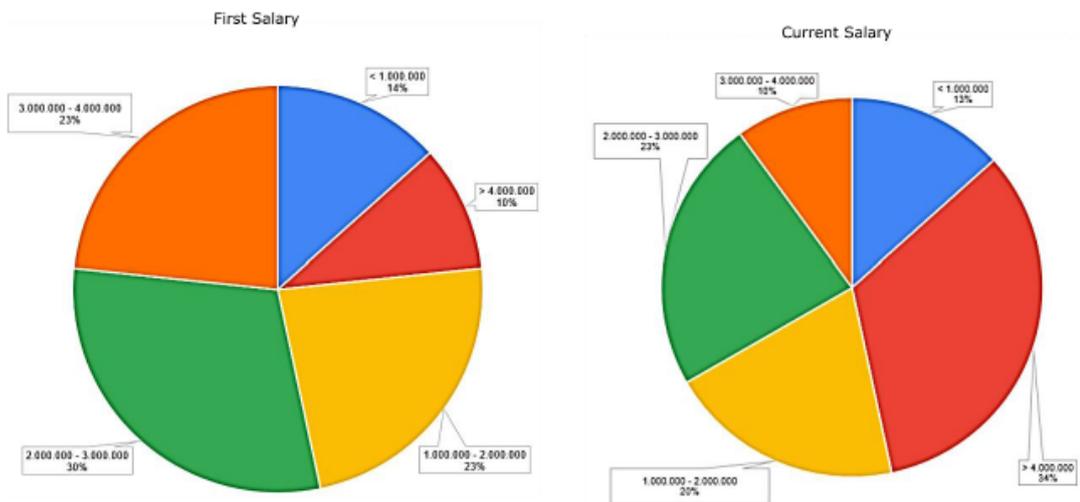
**Magister** meaning in the Fig 6.6: Based on the tracer study results, the Ba Biology program have found about 21.6% fresh graduates who are **continuing their further study for master degree.**

##### ● Page 15, 1st paragraph (Ba. Biology):

**ASIIN:** *In terms of income, the entry and current salary for most graduates was reported to exceed **the minimum regional salary.***

**Comment/response:**

In terms of income, the first and current salary for most graduates was reported about IDR 2,200,000 in average exceeding the 2022 minimum regional salary (IDR 1,891,567). The minimum-maximum range of the salary is about IDR 1,000,000-5,000,000 see Figure 1.



**Figure 1.** The first and current salary for most graduates (survey was done in 2022)

• **Page 15, 2<sup>nd</sup> paragraph (Ba. Biology):**

**ASIIN:** *Graduates, following the profile of becoming a teacher, suggested the inclusion of more practical teaching experience during their studies to support their profession.*

**Comment/response:**

The alumni attending during ASIIN visitation is not a teacher of High School but he is a Lecturer at the University. It means the students have to continue their study for a master degree as the minimum requirement of an education qualification for a lecturer position. Teacher profile does not belong to the Ba Biology program therefore no pedagogic skills (practical teaching experience) are offered.

• **Page 15, 3<sup>rd</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *Regarding the competence of graduates, the survey responses revealed that the alumni of Master in Biotechnology reportedly disposed of good competencies, but requested a further upgrade of the program in terms of English language, computer as well as negotiation skills.*

**Comment/response:**

The skills of English language, computer and negotiation are upgraded by emphasizing those skills through several activities that have been done regularly in Ma Biotechnology. We add more students' activities in teaching and learning process, such as presentation in English and make English day become twice in a week (before only one in a week). While for negotiation skill, it can be increased through an internship program.

● **Page 16, 1<sup>st</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *For the latter, the experts recommend further specifying for stakeholders, what the added benefits for the graduate program in biotechnology are and in what aspect the program differs from the Master in Biology, which is also on offer at UNEJ.*

**Comment/response:**

The teaching and learning in the graduate program of biotechnology has focused on agriculture and health in order to support industrial agriculture. Every module is mandatory to include biotechnology-related contents. Moreover, every title (including method) of the final project of the graduate program in biotechnology student must have strong correlation with biotechnology area. Thus, benefit of the graduate of program in biotechnology that can be identified by the stakeholder is producing the graduates with strong qualification in biotechnology.

● **Page 16, 4<sup>th</sup> paragraph (Ba. Biology):**

**ASIIN:** *The experts nevertheless consider the profile of an entrepreneur not to be suitably matched by the program content, as there is only one module in each program. They recommend further substantiating this specific profile by appropriate courses in entrepreneurship.*

**Comment/response:**

It is true, there is just one compulsory course entrepreneurship. This course is delivered based on Presidential Decree since 1995 and Government Policy in 2010 focusing content on basic entrepreneurship. Entrepreneurship recommended by our government refers to UMKM (Usaha Mikro Kecil dan Menengah) or Micro Small and Medium Enterprise (MSME) or home industries. The main objective is to reduce unemployment by giving

opportunities for people to utilize resources as product commercialization. To give knowledge, skill, and competences on biological product commercialization (bio entrepreneurs), Ba Biology Program develop six courses (product pictures as seen in **Figure 2**) such as:

- 1) Ethnobotany: exploration, utilization and product commercialization of goods related to the ethnobotany
- 2) Ornamental plant: exploration, cultivation, and commercialization of ornamental plants
- 3) Ecotourism: development (by Attraction, Amenities, Accessibility, and Ancillary identification and analysis) and promotion package selected area for ecotourism
- 4) Microtechnique: process and product based on plant and animal microscope slides (One example: non-embedding technique for plant stem microscope slide made by a student) [https://www.youtube.com/watch?v=209hTzD\\_tmc](https://www.youtube.com/watch?v=209hTzD_tmc)
- 5) Tissue Culture: process and product based on plant tissue culture techniques
- 6) Industrial of Microbiology: process and product of fermented foods



**Figure 2.** Processes and Products by students in Bio-Entrepreneur Courses

These courses provide knowledge and skill experiences for the students to create various commercial products based on biological resources at the level of home industry (UMKM)

• **Page 16, 4<sup>th</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *Entrepreneurship in their opinion requires a multi-level project plan (including environmental, ethical and social aspects), but also backed up by a*

*comprehensive scientific plan. For the MSc in Biotechnology, group management could be a topic to facilitate entrepreneurship.*

**Comment/response:**

We do agree with the peer's recommendation to add group management as a topic to facilitate entrepreneurship. The implementation of the topics related with entrepreneurship will be accommodated along with the student's internship program.

• **Page 16-17, last paragraph (Ma. Biotechnology):**

**ASIIN:** *In spite of the fact, that the strength of the faculty is in the area of agriculture and health, the research profile, especially, but not only in the Biotechnology program, does not clearly match such expertise, a Master of Science in Biotechnology is as of now not a research group leader according to an international standard. The experts before this background recommend strengthening and sharpening the profile by adjusting the content and methodology of respective courses (such as Microbiology or Research Methodology) with respect to agriculture and health.*

**Comment/response:**

We agree with expert recommendations. We will adjust module content in courses related to their orientation in the fields of agriculture and health.

**Criterion 1.2 Name of the degree program**

Its sufficient

**Criterion 1.3 Curriculum**

**a) Page 22, 2<sup>nd</sup> paragraph (Ba. Biology):**

**ASIIN:** *The experts see a heightened need for the students to read and write scientific English at a satisfactory level and to familiarize students with biology specific vocabulary. The experts recommend offering courses in English and/or offer English students' seminars and lectures.*

**Comment/response:**

We agree in offering courses in English and/or offer English students' seminars and lectures.

**b) Page 22, 3<sup>rd</sup> paragraph (Ba. Biology):**

**ASIIN:** *Regarding the module handbook, there is a **need** to improve a certain number of module descriptions. This is the case for the module descriptions in basic physics and chemistry, which need to be completed and specified with regard to current methods and instruments. There should be an introduction into current methods (e.g. HPLC, spectroscopy) depending on available modern equipment. The experts also see an overlap between the modules Microbiology and Microbial Physiology, which should be cleared up. The description of the module Microbiology deals almost exclusively with observations, whereas growth curves, different media, fermentation, environmental conditions etc. Are not mentioned. Since the module manual handed out to participants indicates that these topics are contained, the experts consider it a requirement refreshing and completing the respective module descriptions.*

**Comment/response:**

We accommodate the expert recommendation by updating and uploading new modules of Basic Physics, Basic Chemistry, Microbiology, and Microbial Physiology as suggested. Topics related to current methods such as HPLC are carried out in biochemistry courses. The principle of Spectroscopy is a part of the optic topic in Basic Physics course (see Ba Biology-module handbook attached or can be accessed at [https://biologi.fmipa.unej.ac.id/?page\\_id=3638](https://biologi.fmipa.unej.ac.id/?page_id=3638) )

**c) Page 22, 4<sup>th</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *The experts recommend focusing and arranging modules clearly along the topics of agriculture and health for strengthening agro-industrial and medical contents. At least the module descriptions (such as, but not only, Molecular Virology and Microbiology) must be more informative and specific to meet the requirements.*

**Comment/response:**

We agree with expert recommendations. We adjusted module content in courses related to their orientation in the fields of agriculture and health for strengthening agro-industrial and medical contents (**ModuleHandbookBiotechnology**).

d) Page 22, 5<sup>th</sup> paragraph (Ma. Biotechnology):

**ASIIN:** *The experts also take up comments by stakeholder in the interviews that fermentation skills are lacking in the curriculum. This in their eyes should be added as content of the curriculum in appropriate modules. This finding also correlates with the fact, that there is only rather limited equipment for culturing microorganisms (exclusively available is one overaged shaking incubator and no lab fermenter). For solving the capacity bottleneck in order to provide students with such indispensable knowledge at least one large shaking incubator and a lab fermenter is required.*

**Comment/response:**

Adjustment content of some appropriate modules to strengthen the fermentation skills of students was done, such as module of Bioprocess and Fermentation Technology. It is supporting learning activities of those modules; we also provided the related equipment such as large shaking incubator and Laboratory Bioprocess (with main focuses of microbial fermentation) located at the third floor of Integrated Laboratory [CDAST] (Figure 3).



**Figure 3.** Laboratory of Biomaterial and Bioprocess Engineering (a & b) equipped with large shaking incubator (c & d) and Laboratory Scale Fermenter for Industrial, Capacity of 5 Liters (e).

e) Page 22, 6<sup>th</sup> paragraph (Ma. Biotechnology):

**ASIIN:** *While most interviewees expressed their general satisfaction with respect to the level of knowledge and the skill set of the graduates, almost all*

*criticized the student's missing aptitude for teamwork. Thus, the experts recommend strengthening the aspect of group work in suitable courses.*

**Comment/response:**

We agree with the recommendation by designing and integrating several psychomotor aspects of group work in courses including learning methods that focus on team-based work (such as in course of Molecular Detection) and other courses.

**f) Internship,**

• **Page 23, 1<sup>st</sup> paragraph (Ba. Biology):**

**ASIIN:** *Within the Bachelor program in Biology, an internship is not mandatory and not an integral part of the curriculum. It does not appear in the module handbook as a separate entity and there are no clear learning outcomes defined for this activity. Students thus far have been doing an internship at best on a voluntary basis during the summer vacation, usually for a short period of time without payment and without receiving credits for it.*

• **Page 24, 2<sup>nd</sup> paragraph (Ba. Biology):**

**ASIIN:** *As regards the Bachelor program, the experts are concerned. By the way, the internship exercise is currently organized, as no clear rules and university regulations regarding the duration, support and framework conditions have been formulated. In the curriculum and course description, they do also do not find the corresponding module nor a precise formulation of expected learning outcomes, but only a range of courses, which can be "converted" with a limited amount of around 3 credits.*

• **Page 24, last paragraph (Ba. Biology):**

**ASIIN:** *The experts suggest that the Internship in the Bachelor program becomes an obligatory, formal, integral part of the curriculum. They see value in providing clear guidance about internship opportunities and better defining its relevance to the thesis and future career of the students.*

**Comments/Responses:**

Internships are currently managed more effectively with the MBKM (Independent Campus-Independent Study) apprenticeship program policy strongly recommended by the ministry of education since 2020. This program facilitate internship for student to do learning activity outside campus which

is regularly implemented in the 5<sup>th</sup> and 6<sup>th</sup> semester. One internship activity is valued as 20 credits in total (the range credits are 2-3 for each course) of the courses for one semester. The established partnerships of specific industries, protected areas, research centres and relevant places are selected as destination locations for student internship. With the MBKM internship, the problem of the location of the internship destination can be resolved because the institution accepting student internships is available on an ongoing basis and the institution has been verified by the MBKM internship system. Student internship activities can be planned and monitored with a course conversion mechanism that correlates with internship activities. Course conversions at MBKM are listed and integrated in the curriculum. Increasing student participation in the MBKM internship is carried out by outreach to students done regularly every semester, sharing information via social media, and involving prospective supervising lecturers and the head of the laboratory to encourage students to take part in the MBKM internship.

**g) International Mobility**

**Page 26, last paragraph (Both Programs):**

***ASIIN:** the expert recommends that UNEJ and the Faculty for Mathematics and Natural Sciences considers the implementation of new strategies to foster student mobility. This would be vital importance for students to improve their English proficiency, to get to know other educational systems, and to enhance their job opportunities*

**Comment/response:**

To improve students' English skills, Project Coordinator for Erasmus+ KA171 and PACE UP, and International Office pursue partnership networking for both program with partner from Germany (FUAS, Biberach, Tübingen), Vietnamese German Centre for Medical Research (VG-CARE), UK (Nottingham), Denmark (Southern Denmark) and others to facilitate the international mobility for Technician, lecture, and students. Involving the students in international events such as students exchange, English debate competition, English day, international seminar or workshop, summer course, and capacity building training/short course. University has policy that all graduate should have minimum English proficiency (TOEFL ITP) of 450 and 475 for Ba Biology and Ma Biotechnology, respectively.

#### **Criterion 1.4 Admission requirements**

##### **a) Page 29, 1<sup>st</sup> paragraph (Both Programs):**

**ASIIN:** *For the academic year 2020/21, the ratio is between 1:... for the Bachelor in Biology degree program and 1: ,,for the Master in Biotechnology program.*

##### **Comment/response:**

Generally speaking, the number of applications is considerably higher than the number of admitted students. For the academic year 2020/21, the ratio is **1:8** for the Bachelor in Biology degree program and **1:1** for the Master in Biotechnology program.

##### **b) Page 29, last paragraph (Ma. Biotechnology):**

**ASIIN:** *As regards the low enrolment numbers for the Master program, the experts in their interviews learn that a Master qualification is not always the most popular qualification for a student to apply for a job and for the Indonesian job market to absorb. They nevertheless believe that marketing efforts as well as funding opportunities need to be increased and that more should be done to convince UNEJ's own Bachelor students to continue their studies at their Almamater.*

##### **Comment/response:**

Ma. Biotechnology will improve the previous program that has been done to attract prospective students, such as advertise the study program through social media, direct promotion to bachelor students, provide research funding. Since this year, Ma Biotechnology is listed in the Indonesia Endowment Funds for Education (LPDP) scholarship. We assure that this will be increase the prospective students as well as enrolling students. Some have already been done in Ma Biotechnology such as some new students are own Bachelor students from UNEJ Alumni and recruited because of having a similar research focus in the field of biotechnology. These students will continue their study in Ma Biotechnology using (partial) financially support by their supervisor' project.

In additionally, the university supports international student by scholarship covering tuition fees, accommodations, and partial living allowances.

### **Criterion 1.5 Workload and Credits**

#### **a) Page 30, last paragraph (Both Programs):**

**ASIIN:** *According to the data, the average study period of the students from the Bachelor in Biology amounts to 4.3 semesters and for the Master in Biotechnology 4.6 semesters*

**Comment/response:**

The numbers are correct. It is a typo: The average study period of the students from the Bachelor in Biology amounts to **4.3 years** and for the Master in Biotechnology **2.5 years**.

### **Criterion 1.6 Didactic and Teaching Methodology**

#### **a) Page 32, 2<sup>nd</sup> paragraph (Ma. Biotechnology)**

**ASIIN:** *They do however not understand the ECTS calculations for the Master program, as the figures provided do not correspond to the standards span of 25-30 European credits per semester and ask the program coordinator for clarification*

**Comment/response:**

According to our review and recalculation to the credit system in the study program, we recalculated that 1 credit is equal to 1.81 ECTS. Therefore, Ma. Biotechnology provides 42 SKS that equal to 76.02 ECTS.

#### **b) Page 32, 5<sup>th</sup> and last paragraph (Both Programs)**

**ASIIN:** *There continues however to be a need to improve English language skills, including writing, listening, and writing. To solve this problem, most lecturers are expected to give teaching material, presentations, and assignments in English. Furthermore, students are expected to use the centre for language to improve their conversation, writing, and grammar. Students also possibly improve their English skills by attending additional English courses at the Language Centre of UNEJ. The development of critical thinking skills by means of student-centered learning remains a challenge. This finding is further supported by remarks of students, who are in favour of more challenging examination formats.*

**Comment/response:**

We agree to the recommendation for English proficiency improvement. To improve *the development of students' critical thinking skills*, the both programs deliver learning methods of case study, project-based learning, or article and

video reviews in more than 50% of courses (see modules). The students and lecturers join the training and to use all the facilities in Language Centre Learning with no fee (free of charge). There is a Rector Decree as policy for new lecturers to join English Training (mandatory).

## 2. Exams: System, Concept and Organization

### Criterion 2 Exams: System, concept and organization

#### a) Page 36, 2nd paragraph (Both Programs):

**ASIIN:** *It is not clear to the experts how students are really guided through a thesis project, thereby avoiding these serious mistakes. What the experts are missing in some of the sample work provided, is a critical, scientific evaluation of the data; some of the material and methods used are not state-of-the-arts and they also find that there are insufficient figure legends and the terms of scientific writing needs to be improved, not only in terms of English proficiency.*

#### **Comment/response:**

As recommended by the expert, the **Ba Biology** program is also revising and upgrading the system of thesis preparation and supervision to assure that all student work in the future complies with a sufficient scientific standard in line with a Bachelor Degree. There are Bachelor Thesis Modules, writing scientific papers guidelines for thesis (PPKI 2023), and Thesis SOP as guidelines for the students to propose and write Bachelor thesis (**SOPThesisCommitteeBaBio**) There is also SOP Committee Thesis for Supervision guideline to ensure the standard of thesis (**SOPThesisSupervisor; ThesisLogbookBaBio**)

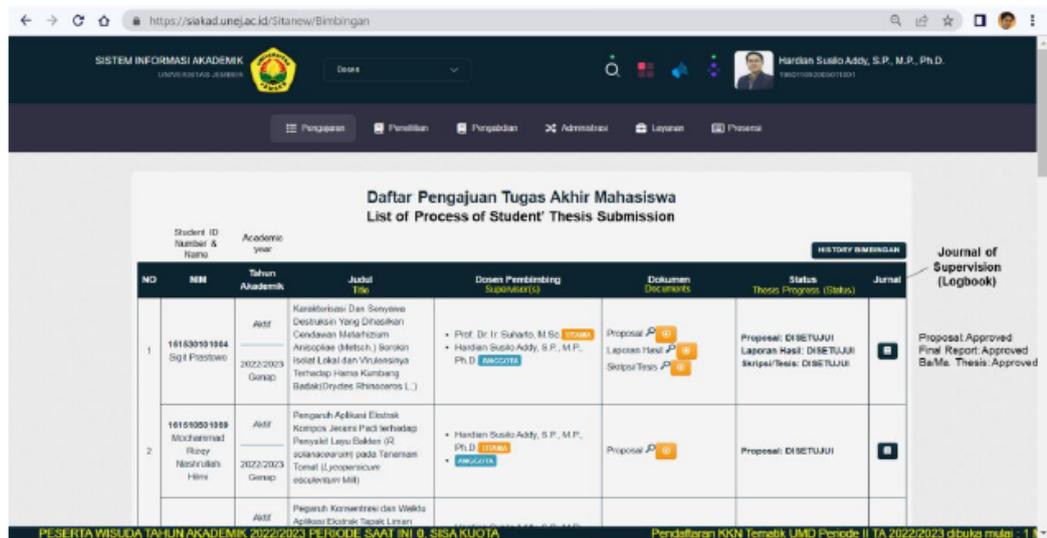
**As recommended for the Ma. Biotechnology**, thesis preparation and supervision system are completed by the involvement of an external examiner and proofread by the expert. Seminar progress of the thesis is carried out twice in a semester, attended by principle and co-supervisor, as well as the thesis supervision commission. During the seminar, the quality of the thesis draft is evaluated. The final thesis evaluation is continued until it is ready for the examination which will be evaluated by an internal and external examiner (**SOPThesisMaBiotechnology**).

**b) Page 36, 3<sup>rd</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *The experts in summary identify a significant lack in expert thesis supervision given that the deficits observed are not minor mistakes but a substantial lack of understanding how science is carried out (nature of science).*

**Comment/response:**

Considering this concern, the Ma. Biotechnology will take an action by intensifying the Thesis supervision committee. The intensification covers the progress report every 3 months to ensure that the supervisors for scientific substances are properly carried out. Furthermore, university provided thesis supervision logbook by system (SISTER) (**Figure 4**).



**Figure 4.** Screenshot thesis logbook in SISTER

**c) Page 36, 4<sup>rd</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *The experts see a necessity revising and upgrading the system of thesis preparation and supervision to assure that all student work in the future complies with a sufficient scientific standard in line with a Bachelor and Master qualification. It might be an idea setting up a collection of good BSc and MSc theses from other countries and use these in preparation seminars as examples (for discussion of the science and the formal set up of a thesis)*

**Comment/response:**

Study program will take some actions. We believe that improving the quality of student to present the research data will be interfered through strengthening and deepening the content of research methodology lectures and research seminar activities.

**d) Page 36. 5<sup>th</sup> paragraph (Both Programs):**

**ASIIN:** *The experts also question the meaningfulness of publishing a Master and especially a Bachelor thesis in scientific journal.*

**Comment/response:**

There is no publication requirement for **Ba. Biology** Thesis in a scientific journal for graduation. Publishing a scientific paper is a requirement for Ma. Biotechnology' student. As stated in the National Standard for Higher Education regulation, students must publish an article in an accredited national publisher.

**e) Page 36, last paragraph (Both programs):**

**ASIIN:** *Following up on suggestions from students themselves, the experts furthermore recommend offering more study case type of exam questions to stimulate student's critical thinking abilities*

**Comment/response:**

We agree as recommended by the expert, in line with page 32, 5<sup>th</sup> and last paragraphs. Indeed, Assessment for Ma. Biotechnology's student through the examination will be insisted to all subject offered in Ma Biotechnology using study case type question in order to stimulate the student to develop their ability of critical thinking on biotechnological cases.

**f) Page 37, 1<sup>st</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *To save time for students in the Ma Biotechnology, the experts recommend allowing students to graduate even if the required number for a graduation ceremony is not reached.*

**Comment/response:**

The Study program and Graduate Program normally provide Judicium for students who have completed their credits and fulfil the master degree requirements. Judicium always is held prior to graduation ceremony and is obligated to all master students mentioned. Meanwhile, attending the graduation ceremony is not the obligation. In addition, the length of study is determined as the time from the student for the first timer registered as a student until theirs passed the thesis examination.

**g) Page 37, 2<sup>nd</sup> paragraph (Ba. Biology):**

**ASIIN:** *As regards the grading system, the experts in their review of a sample of exams find in some instances an obvious mismatch between the quality of the answers and the grades given. The experts at the same time learn that within a short period of time, the GPA for both programs under review has increased significantly (from a GPA of below 3 to a remarkable 3.5). The experts question the motives for this raise in performance before the background, that the downgrading by the national QA agency BAN-PT to a “B category accreditation” was connected to not reaching the threshold of 3 plus, which constitutes the threshold for the best A accreditation. The experts recommend systematically establishing a system of external examiners in line with what is already done on the level of the Master thesis grading (see above).*

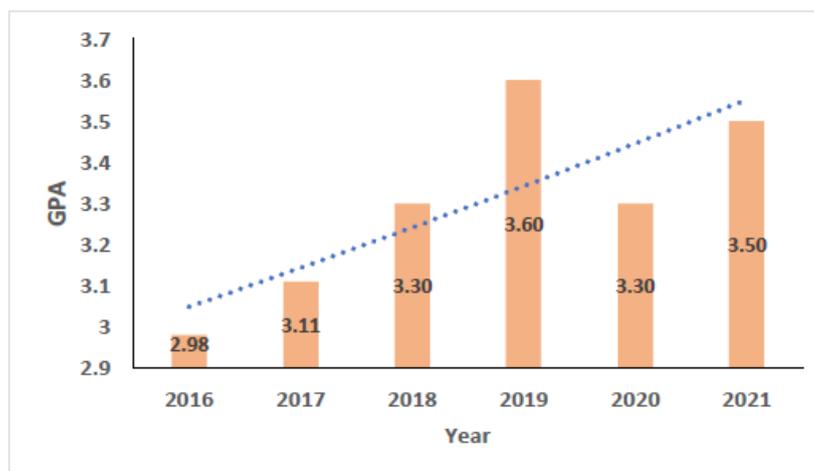
**Comment/response:**

We have rechecked five examples of student exams (course: health biotechnology, natural medicine, endocrinology, industrial microbiology, and microbiological analysis techniques). There was a mistake in sending the relevant rubric for the assignments for health biotechnology, industrial microbiology, and microbiological analysis techniques courses, we resend the relevant rubrics (Table 1; **attach files**).

**Table 1.** Rubric Used revised for Evaluation mismatch

<b>Courses</b>	<b>Rubric used before</b>	<b>Revised Rubric</b>
Health Biotechnology	Essay Rubric	Article Review Rubric
Natural Medicine	Poster Rubric (relevant)	Poster Rubric
Endocrinology	Case Method presentation	Case Method presentation
Industrial microbiology	General Essay Rubric	Specific Essay Rubric based on topic
Microbiological Analysis Techniques	General Essay Rubric	Specific Essay Rubric based on topic

The student GPA average 2.98 was achieved in 2016 (during the Accreditation reviewed by Higher Education National Accreditation Agency). However, the student GPA started to increase in 2017-2021 as seen in Figure 5.



**Figure 5.** The GPA of graduate students of Ba. Biology in 2016-2021

In Ma. Biotechnology, student thesis is examined by at least two internal examiners. However, an external examiner has also been initiated but not massive. Further, all master thesis will be examined by a relevant external examiner.

### 3. Resources

#### Criterion 3.1 Human Resources, Staff Development and Student Support

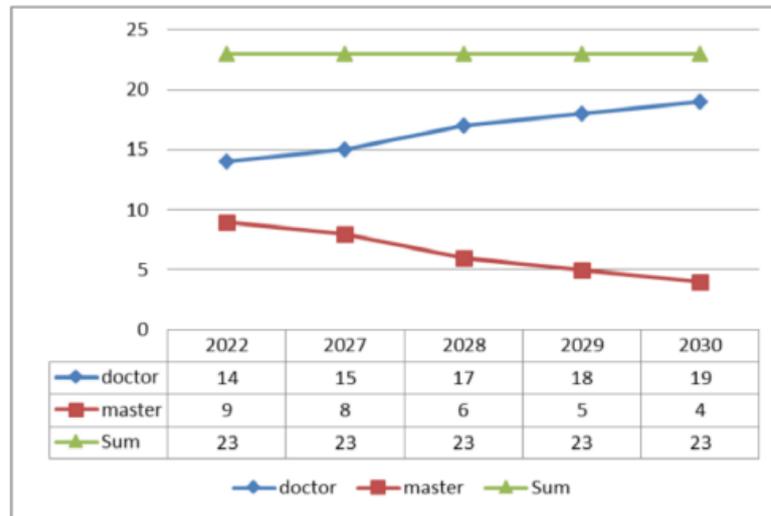
##### a) Page 42, last paragraph (Ba. Biology):

**ASIIN:** *Regarding the quantity and qualification level of the staff working in the faculty, the number of staff especially in the ranks of full-time professor is not high, but in the expert's eyes currently sufficient to implement the two programs under review. The high number of Master graduates teaching in the Bachelor of Biology program however remains a concern to the experts while acknowledging that professional development plans are underway further upgrading the lecturer qualifications. They nevertheless recommend speeding up this process to safeguard the necessary qualification level for the undergraduate program.*

##### **Comment/response:**

Efforts to improve the qualifications of master lecturers to become doctors have been carried out by facilitating the administration process for lecturers to register for doctoral programs from both internal and external funding as well as scholarship information, utilizing existing collaborations (MOA), and

facilitating English training (IELTS) for academic purposes for studying preparation. In addition, the faculty are making the time table plan for the lecturers to take the doctoral degree as seen in Figure 6.



**Figure 6.** Time plan for the lecturers to take the doctoral degree during 2022-2030

To accelerate the number of professors, some strategies have been carried out (as stated in SAR ASIIN page 38) by applying the “Professorship Acceleration Research Grant ” such as Dr. Kahar Muzakhar, and Dr.rer.nat Kartika Senjarini) who have already promoted for professors to The Ministry of Education, Culture, Research, and Technology of Indonesia in January-April 2023. Faculty also accommodates 2 professor candidates (Dr. Rike Oktarianti and Hari Sulistiyowati PhD) targeted to fulfil and complete documents requirements by the end of April 2023.

**b) Page 43, 3th paragraph (Ba. Biology):**

**ASIIN:** *The experts nevertheless take note of the fact that teaching staff at the department would nevertheless appreciate more tailor-made professional development courses to assist them in writing adequate research papers to place them in indexed journals or successfully applying for international research projects.*

**Comment/response:**

The efforts to increase research publication of lecturers to reputable journals has been conducted at the university level (LP2M-Research Centre and Community Services Unit). The LP2M had done a scientific writing workshop

for publication assistance into reputable journals. In addition, The University provides rewards for lecturers whose articles are published in highly reputable international journals.

**c) Page 43, 5<sup>th</sup> paragraph (Ma. Biotechnology):**

**ASIIN:** *The research capacities of the teaching staff contribute needs to be further strengthened and supported.*

**Comment/response:**

The teaching staffs of Ma. biotechnology is active in research activities. Most of them receive research grants from the government or UNEJ every year and all of the titles of the student's thesis are part of the teaching staff research projects. However, we agree with the expert suggestion to strengthen and support research capacities of the teaching staff contribution. To accommodate the expert suggestion, we are planning to propose to the university to implement two strategic actions; 1) increase the number of advanced research equipment's and 2) establish and strengthen research collaboration with foreign and domestic institutions.

**Criterion 3.2 Funds and equipment**

**a) Page 45, 2<sup>nd</sup> paragraph (Ba. Biology):**

**ASIIN:** *The expert also recommends investing in the further diversification of the income sources of the faculty/ department outside of tuition fees (third party funding, provision of paid continuous education courses/ short cycle programs).*

**Comment/response:**

The University of Jember shifts to BLU (public service institution) management implementation. It means that the university has room to manage the institution, specifically in budget and financial management. Therefore, the source of funds varies involving the budget from a third party.

**b) Page 45, last paragraph (Ba. Biology):**

**ASIIN:** *There is however only rather limited equipment for culturing microorganisms. The experts seed a need for the procurement of at least one large shaking incubator and a lab fermenter.*

**Comment/response:**

The university has committed to fulfil the equipment as suggested with the following years budgets. At the moment, the students can use the integrated

laboratory of CDAST that provides a large shaking incubator and lab fermenter (Figure 3).

## 4. Transparency and documentation

### Criterion 4.1 Module descriptions

#### a) Page 46, 2<sup>nd</sup> paragraph (Ma. Biotechnology):

**ASIIN:** *While generally appreciating the quality of the module handbooks, the experts identify the need to improve on certain module descriptions, which have been already identified in prior parts of this report.*

#### **Comment/response:**

Revision of the descriptions of several modules as in the Module handbook has been carried out by including some information including alignment and strengthening on the topic of biotechnology in agriculture and health to support industrial agriculture (Updated Modules Appendix)

### Criterion 4.2 Diploma and Diploma Supplement

#### a) Page 46, 4<sup>th</sup> paragraph (Ma. Biotechnology):

**ASIIN:** *As to the Diploma Supplement, no such document is available for the graduates of the Master in Biotechnology, which needs to be corrected in order to comply with the ASIIN requirements.*

#### **Comment/response:**

Based on the Rector's Decree 2338/UN25/KM/2023 (attached), the Diploma supplement shall give to graduated undergraduate and graduates' students including Ma. Biotechnology. Recently, Ma. Biotechnology issues a Diploma Supplement for its graduates (Example of [SKPI attached](#)).

### Criterion 4.3 Relevant rules

Its sufficient

## 5. Quality management: quality assessment and development

### Criterion 5 Quality management: quality assessment and development

#### a) Page 48, 2<sup>nd</sup> paragraph (Ba. Biology):

**ASIIN:** *External Quality Assurance exercises of UNEJ and the Faculty are related to the legal obligation to submit every degree program for accreditation to the national Indonesian Accreditation Agency (BAN-PT) in addition to the compulsory institutional accreditation. The two programs under review have received the second highest accreditation status (B) from BAN-PT. The downgrading was mainly due to the access in the standard period of study as well as falling below the threshold of 3 in the GPA average of students (which in the eyes of the expert is a controversial and even counterproductive measurement to integrate in the assessment, see their comments under criterion 2: examination system. In addition to these national procedures, international accreditation (such as this procedure by ASIIN) is done on a voluntary basis in UNEJ's quest to become internationally recognized and to improve it's standing in international rankings*

#### **Comment/response:**

It is in line with our respond at page 37, 2<sup>nd</sup> paragraph

## F Summary: Peer recommendations (19.05.2023)

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

<b>Degree Programme</b>	<b>ASIIN seal</b>	<b>Subject-specific labels</b>	<b>Maximum duration of accreditation</b>
Ba Biology	With requirements for one year	-	30.09.2028
Ma Biotechnology	With requirements for one year	-	30.09.2028

### Requirements

#### For all degree programmes

- A 1. (ASIIN 1.5) Define how many hours of students' total workload are required for one ECTS point.
- A 2. (ASIIN 2) It is necessary to revise and upgrade the system of thesis preparation and supervision by adequately qualified supervisors to assure that Bachelor and Master theses show an adequate scientific standard.
- A 3. (ASIIN 3.3) Upgrade and increase the technical equipment for culturing microorganisms.
- A 4. (ASIIN 4.2) Rewrite the module descriptions to avoid overlaps in the content.

#### For the Master's programme

- A 5. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

### Recommendations

#### For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to design new strategies for fostering students' academic mobility.
- E 2. (ASIIN 2) It is recommended to offer more study case type of exam questions to stimulate student's critical thinking abilities.

- E 3. (ASIIN 2) It is recommended to establish a system of external examiners to safeguard the integrity of the grading system.
- E 4. (ASIIN 3.1) It is recommended to institutionalise individual short and mid-term career development plans for each individual staff member.
- E 5. (ASIIN 3.1) It is recommended to speed up the qualification process for staff members with a Master qualification.
- E 6. (ASIIN 3.1) It is recommended to offer more professional development courses for teachers.
- E 7. (ASIIN 3.2) It is recommended to reserve a budget exclusively at the disposition of the faculty/department, thereby strengthening its autonomy.
- E 8. (ASIIN 3.2) It is recommended to invest in the further diversification of the income sources of the faculty/department outside of tuition fees (third party funding, provision of paid continuous education courses/short cycle programmes).

**For the Bachelor's programme**

- E 9. (ASIIN 1.1) It is recommended to substantiate the graduate profiles of an entrepreneur and as a researcher by appropriate courses.
- E 10. (ASIIN 1.3) It is recommended to provide clear guidance about internship opportunities and better defining its relevance for the students' career perspectives.

**For the Master's programme**

- E 11. (ASIIN 1.1) It is recommended to further specify the added benefits of the programme and how it differs from the parallel offered Master programme in Biology.
- E 12. (ASIIN 2) It is recommended to systematically use students' journals for publishing the results of the Master theses instead of keeping the requirement to publish in national/international journals.
- E 13. (ASIIN 2) It is recommended to allow students to graduate even if the threshold for the graduation ceremony has not been reached.
- E 14. (ASIIN 3.1) It is recommended to increase and professionalise marketing efforts to attract more students to the Master programme in Biotechnology.

## **G Comment of the Technical Committee 10 – Life Sciences (12.06.2023)**

*Assessment and analysis for the award of the ASIIN seal:*

As in many other procedures in Indonesia, there are requirements regarding the conversion of Indonesian credits into ECTS points, the module descriptions, the low academic mobility, the technical equipment as well as the execution of the theses. In addition, 14 recommendations are proposed. After a short discussion about the procedure and the unusually large number of recommendations, the TC agrees with the assessment of the expert group. However, the TC asks to reword recommendation E13 as it is not clear what “threshold for the graduation ceremony” means.

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

<b>Degree Programme</b>	<b>ASIIN seal</b>	<b>Subject-specific labels</b>	<b>Maximum duration of accreditation</b>
Ba Biology	With requirements for one year	-	30.09.2028
Ma Biotechnology	With requirements for one year	-	30.09.2028

## H Decision of the Accreditation Commission (23.06.2023)

*Assessment and analysis for the award of the ASIIN seal:*

The AC discusses the procedure and the high number of recommendations. The AC agrees with TC 10 – Life Sciences that the meaning of recommendation E13 is not clear. The reason for the recommendation is that there needs to be a certain number of graduates in order to conduct the graduation ceremony. This causes an unnecessary delay in graduation, because students have to wait until enough graduates are available. For this reason, the AC changes the wording of recommendation E13. Otherwise, the AC follows the suggestion of the experts.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2028
Ma Biotechnology	With requirements for one year	-	30.09.2028

### Requirements

#### For all degree programmes

- A 1. (ASIIN 1.5) Define how many hours of students' total workload are required for one ECTS point.
- A 2. (ASIIN 2) It is necessary to revise and upgrade the system of thesis preparation and supervision by adequately qualified supervisors to assure that Bachelor and Master theses show an adequate scientific standard.
- A 3. (ASIIN 3.3) Upgrade and increase the technical equipment for culturing microorganisms.
- A 4. (ASIIN 4.2) Rewrite the module descriptions to avoid overlaps in the content.

#### For the Master's programme

- A 5. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

## **Recommendations**

### **For all degree programmes**

- E 1. (ASIIN 1.3) It is recommended to design new strategies for fostering students' academic mobility.
- E 2. (ASIIN 2) It is recommended to offer more study case type of exam questions to stimulate student's critical thinking abilities.
- E 3. (ASIIN 2) It is recommended to establish a system of external examiners to safeguard the integrity of the grading system.
- E 4. (ASIIN 3.1) It is recommended to institutionalise individual short and mid-term career development plans for each individual staff member.
- E 5. (ASIIN 3.1) It is recommended to speed up the qualification process for staff members with a Master qualification.
- E 6. (ASIIN 3.1) It is recommended to offer more professional development courses for teachers.
- E 7. (ASIIN 3.2) It is recommended to reserve a budget exclusively at the disposition of the faculty/department, thereby strengthening its autonomy.
- E 8. (ASIIN 3.2) It is recommended to invest in the further diversification of the income sources of the faculty/department outside of tuition fees (third party funding, provision of paid continuous education courses/short cycle programmes).

### **For the Bachelor's programme**

- E 9. (ASIIN 1.1) It is recommended to substantiate the graduate profiles of an entrepreneur and as a researcher by appropriate courses.
- E 10. (ASIIN 1.3) It is recommended to provide clear guidance about internship opportunities and better defining its relevance for the students' career perspectives.

### **For the Master's programme**

- E 11. (ASIIN 1.1) It is recommended to further specify the added benefits of the programme and how it differs from the parallel offered Master programme in Biology.
- E 12. (ASIIN 2) It is recommended to systematically use students' journals for publishing the results of the Master theses instead of keeping the requirement to publish in national/international journals.
- E 13. (ASIIN 2) It is recommended to allow students to graduate even if the necessary number of graduates for the graduation ceremony has not been reached.

E 14. (ASIIN 3.1) It is recommended to increase and professionalise marketing efforts to attract more students to the Master programme in Biotechnology.

## 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 Biology:

Code	PLOs	Code	Indicators
<b>Attitude</b>			
PLO1	able to <b>internalize</b> norms and ethics based on Pancasila in working independently or in groups	1.a	<b>showing</b> an honest attitude and responsibility as the practice of Pancasila
		1.b	<b>working</b> individually or in team works
<b>Knowledge</b>			
PLO2	able to <b>analyse</b> the principles of biology, mathematics, and other relevant natural sciences	2a	<b>analyzing</b> the basic concepts of biology, mathematics, other relevant natural sciences
		2b	<b>correlating</b> the basic concepts of science (physics, chemistry, mathematics) with the principles of biology
PLO3	Able to <b>analyse</b> the principles of molecular biology, cells, organisms and management of tropical biological resources	3.a	<b>Describing</b> the principles of molecular biology, cells and organisms
		3.b	<b>analysing</b> biological principles that are relevant to the problem of biological resources management in tropics
<b>General skills</b>			
PLO4	able to <b>implement</b> scientific methods for the biological resources management and commercial products development in tropics	4.a	<b>implementing</b> scientific methods for the management of biological resources in tropics
		4.b	<b>demonstrating</b> scientific methods for development of commercial products from the tropical natural resources
PLO5	able to <b>implement</b> the logic of critical thinking on biosafety and environmental issues related to the field of biology with a scientific and bioethical approach	5.a	<b>implementing</b> the logic of critical thinking on biosafety related to the field of biology with a bioethics approach for better environmental awareness
		5.b	<b>using</b> the logic of critical thinking on environmental issues related to

0 Appendix: Programme Learning Outcomes and Curricula

			the field of biology with a scientific and bioethics approach
<b>Special skills</b>			
PLO6	Able to <b>do laboratory work and/or in the field</b> independently and/or in groups for biological concepts implement.	6.a	<b>practising</b> laboratory and/or field works independently and in groups
		6.b	<b>using</b> software applications and/or basic instruments for sampling and analysis in biology and environmental fields
PLO7	able to <b>employ</b> bioscience in solving problems related to biological resources in tropics and to <b>communicate</b> the results.	7.a	<b>integrating</b> bioscience in problems solving related to the management of biological resources in tropics
		7.b	<b>presenting</b> the results of problems solving related to the management of biological resources in tropics

**0 Appendix: Programme Learning Outcomes and Curricula**

The following curriculum is presented:

No	Code	Module	Credits				Prerequisite
			Theo ry	Practice	Credits	ECTS	
<b>The 1<sup>st</sup> Semester</b>							
1	MAU 1101	Calculus	3	1	4	6.04	-
2	MAU 1102	General Physics	3	1	4	6.04	-
3	MAU 1103	Basic Chemistry	3	1	4	6.04	-
4	MAU 1104	Fundamental Biology	3	1	4	6.04	-
5	MPK 9001 MPK 9002 MPK 9003	Religion Education: Islamic Christian Catholic	2	0	2	3.02	-
	MPK 9004 MPK 9005	Hindu Buddhism					
6	MAU 1105	English	2	0	2	3.02	
<b>Total credit of 1<sup>st</sup> semester</b>					<b>20</b>	<b>30.2</b>	
<b>The 2<sup>nd</sup> Semester</b>							
1	MPK 9001	Indonesian	2	0	2	3.02	-
2	MAB 1201	Microbiology	2	1	3	4.53	MAU 1104
3	MAB 1202	Plant Structure	3	1	4	6.04	MAU 1104
4	MAB 1203	Animal Structure	3	1	4	6.04	MAU 1104
5	MAB 1205	Cell Biology	2	0	2	3.02	MAU 1104
6	MAB 1206	Biochemistry	2	1	3	4.53	MAU 1103, MAU 1104
7	MPK 9006	Civic Education	2	0	2	3.02	-
<b>Total credit of 2<sup>nd</sup> semester</b>					<b>20</b>	<b>30.2</b>	

**0 Appendix: Programme Learning Outcomes and Curricula**

<b>The 3<sup>rd</sup> semester</b>							
1	UNU 9001	Pancasila Education	2	0	2	3.02	-
2	MAU 1009	Introduction to Environmental Science	2	0	2	3.02	-
3	MAB 1301	Microbial Physiology	2	1	3	4.53	MAB 1201
4	MAB 1302	Plant Development	2	1	3	4.53	MAB 1202
5	MAB 1303	Animal Development	2	1	3	4.53	MAB 1203
6	MAB 1304	Terrestrial Ecology	2	1	3	4.53	MAU 1104
7	MAB 1406	Genetics	3	1	4	6.04	MAU 1104
<b>Total credit of 3<sup>rd</sup> semester</b>					<b>20</b>	<b>30.2</b>	
<b>The 4<sup>th</sup> semester</b>							
1	MAB 1306	Molecular Biology	3	1	4	6.04	MAB 1206
2	MAB 1402	Plant Systematic	3	1	4	6.04	MAB 1202
3	MAB 1403	Animal Systematic	3	1	4	6.04	MAB 1203
4	MAB 1404	Aquatic Ecology	2	1	3	4.53	MAB 1304
5	MAB 1601	Microtechnique	1	1	2	3.02	MAU 1104
6	MAB 1603	Evolution	3	0	3	4.53	MAB 1406
<b>Total credit of 4<sup>th</sup> semester</b>					<b>20</b>	<b>30.2</b>	

**0 Appendix: Programme Learning Outcomes and Curricula**

The 5 <sup>th</sup> semester							
1	MAB 1502	Plant Physiology	3	1	4	6.04	MAB 1202
2	MAB 1503	Animal Physiology	3	1	4	6.04	MAB 1203
3	MAB 1504	Biostatistics*	2	0	2	3.02	MAU 1101, MAU 1104
4	MAB 1505	Environmental Science	1	1	2	3.02	MAU 1105
5	MAB 1522	Tissue Culture	1	1	2	3.02	MAB 1302, 1303
6		Elective Courses			6	12.08	Please see Table 12
<b>Total credit of 5<sup>th</sup> semester</b>					<b>20</b>	<b>30.2</b>	
The 6 <sup>th</sup> semester							
1	MAB 1006	Research Methodology	2	0	2	3.02	MAB 1504
2	MAB 1307	Bioethics**	2	0	2	3.02	MPK 9001-9005
3	MAB 1506	Bioinformatics**	1	1	2	3.02	MAU 1101, MAB 1206,
4	MAB 1605	Biology Conservation	2	0	2	3.02	MAB 1304
5		Elective Courses			12	31.71	Please see Table 12
<b>Total credit of 6<sup>th</sup> semester</b>					<b>20</b>	<b>30.2</b>	

**0 Appendix: Programme Learning Outcomes and Curricula**

<b>The 7<sup>th</sup> semester</b>							
1	MAU 1008	Community Services Training	0	3	3	4.53	Have taken $\geq$ 110 credits / 166.1 ECTS
2	MAU 1007	Introduction to Entrepreneurship*	2	0	2	3.02	MAU1102, 1103,1104
3	MAU 1010	Occupational Safety and Health*	2	0	2	3.02	MAU 1102, MAU 1103, MAU 1104
		Elective Courses			11		Please see Table 12
<b>Total credit of 7<sup>th</sup> semester</b>					<b>18</b>	<b>27.18</b>	
<b>The 8<sup>th</sup> semester</b>							
1	MAU 1811	Final Project	0	6	6	9.06	GPA of $\geq$ 2; Have taken $\geq$ 120 credits/ 181.2 ECTS; PP 85%
<b>Total credit of 8<sup>th</sup> semester</b>					<b>6</b>	<b>9.06</b>	
<b>Total credit</b>					<b>144</b>	<b>217.44</b>	

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

No	PLOs	Code	Indicators
<b>Attitude</b>			
PLO1	Able to <b>internalize</b> an attitude of piety to God Almighty and love their country	1A	<b>Showing</b> responsibility, honesty, and discipline as the manifestation of piety to God Almighty
		1B	<b>Showing</b> a caring attitude towards the preservation of Indonesian culture and biodiversity as the embodiment of an attitude of loving the country.
<b>Knowledge</b>			
PLO2	Able to <b>develop</b> the biotechnological principles and other relevant sciences	2A	<b>Analysing</b> principles of biotechnology and other sciences related to the agroindustrial problems
		2B	<b>Evaluating</b> principles of biotechnology and other relevant sciences for solving the agroindustrial problems
<b>General Skills</b>			
PLO3	Able to <b>demonstrate</b> the ability to collaborate and to communicate well in verbal and in writing national and/or internationally	3A	<b>Showing</b> collaborative skill during the learning process
		3B	<b>Demonstrating</b> communication skills both in verbal and in writing nationally and/or internationally
<b>Specific Skills</b>			
PLO4	Able to <b>modify</b> skills and knowledge of DNA and	4A	<b>Applying</b> the skills and knowledge of DNA and protein-based biotechnology
	protein-based biotechnology to produce innovative and useful biological products for agroindustrial sectors	4B	<b>Evaluating</b> innovative and useful biological products for agroindustrial sectors
		4C	<b>Producing</b> innovative and useful biological products for agroindustrial sectors
PLO5	Able to <b>manage</b> biotechnology research comprehensively with a multidisciplinary approach to solve problems in agroindustrial sectors.	5A	<b>Analyzing</b> the agroindustrial problems
		5B	<b>Applying</b> biotechnological methods through a multidisciplinary approach to solve agroindustrial problems
		5C	<b>Conducting</b> advanced research to solve agroindustrial problems
		5D	<b>Determining</b> solutions for agroindustrial problems

The following curriculum is presented:

### The 1<sup>st</sup> SEMESTER

No	Code	Module	Credit			
			Theory	Practicum	Total	ECTS
<b>General Compulsory</b>						
1	PBU 2101	Principles of Biotechnology	2	0	2	3.02
2	PBU 2102	Biochemistry and Molecular Biology	2	0	2	3.02
3	PBU 2103	Genetic Engineering and Bioinformatics	2	0	2	3.02
4	PBU 2111	Research Methodology	2	1	3	4.53
<b>Specific compulsory for Agricultural Biotechnology (6 credits)</b>						
5	PBT 2101	Plant-Microbe Interactions	2	0	2	3.02
6	PBT 2102	Molecular Plant Physiology	2	0	2	3.02
7	PBT 2111	Biosynthesis of Primary and Secondary Metabolites	2	0	2	3.02
8	PBT 2112	Biochemical Product Engineering	2	0	2	3.02
9	PBT 2113	Molecular Detection in Agriculture	0	2	2	3.02
<b>Specific Compulsory for Medical Biotechnology (6 credits)</b>						
10	PBK 2101	Gene Therapy	2	0	2	3.02
11	PBK 2102	Biopharmaceutical Innovation	2	0	2	3.02
12	PBK 2103	Molecular Immunology	2	0	2	3.02
13	PBK 2112	Molecular Detection in Medicine	0	2	2	3.02
<b>Total Workload</b>			12	3	15	22.65

**The 2<sup>nd</sup> SEMESTER**

No	Code	Module	Credit			
			Theory	Practicum	Total	ECTS
1	PBU 2204	Cell Propagation	2	0	2	3.02
2	PBU 2202	Bioprocess Engineering	2	0	2	3.02
3	PBU 2211	Regulation of Genetic Engineering Product	2	0	2	3.02
4	PBP 2212	Entrepreneurship in Biotechnology	1	2	3	4.53
5	PBU 2205	Biostatistics	2	0	2	3.02
6	PBP	Elective Courses	4	0	4	6.04
<b>Total workload</b>			<b>13</b>	<b>2</b>	<b>15</b>	<b>22.65</b>

**The 3<sup>rd</sup> SEMESTER**

No	Code	Module	Credit			
			Theory	Practicum	Total	ECTS
1	PBU 2213	Thesis	0	6	6	9.51
2	PBU 2311	Dissemination of Research	0	1	1	1.51
<b>Total workload</b>			<b>0</b>	<b>7</b>	<b>7</b>	<b>11.02</b>

**The 4<sup>th</sup> SEMESTER**

No	Code	Module	Credit			
			Theory	Practicum	Total	ECTS
1	PBU 2312	Scientific Writing	0	2	2	3.02
<b>Total workload</b>			<b>0</b>	<b>2</b>	<b>2</b>	<b>3.02</b>

**The Elective Courses**

No	Code	Module	Credit			
			Theory	Practicum	Total	ECTS
1	PBP 2201	Enzyme Engineering	2	0	2	3.02
2	PBP 2203	Biotechnology in Plant Protection	2	0	2	3.02
3	PBP 2204	Industrial Microbiology	2	0	2	3.02
4	PBP 2213	Fermentation Technology	2	0	2	3.02
5	PBP 2214	Technology on Enzyme Production	2	0	2	3.02
6	PBP 2215	Bio-nanotechnology	2	0	2	3.02
7	PBP 2216	Analysis of Biomolecules	2	0	2	3.02
8	PBP 2217	Metabolic Engineering	2	0	2	3.02
9	PBP 2218	Molecular Virology	2	0	2	3.02
10	PBP 2219	Cancer Immunology	2	0	2	3.02
11	PBP 2112	Technology on Molecular Diagnostics	2	0	2	3.02
12	PBP 2219	Regenerative Medicine	2	0	2	3.02
13	PBP 2220	Personalized Medicine	2	0	2	3.02
14	PBP 2221	Biobanking	2	0	2	3.02