ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Biology Education
Chemistry Education
Mathematics Education
Physics Education

Provided by
Universitas Lampung, Indonesia

Version: 06 December 2024

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Pendidikan Biologi	Undergraduate programme in Biology Education	ASIIN	BAN-PT[3]: B 2020 - 2025	10
Pendidikan Kimia	Undergraduate programme in Chemistry Education	ASIIN	LAMDIK[4]: Baik Sekali (Very Good) 2023-2028	09
Pendidikan Matematika	Undergraduate programme in Mathematics Education	ASIIN	BAN-PT: B 2020 - 2025	12
Pendidikan Fisika	Undergraduate programme in Physics Education	ASIIN	BAN-PT: A 2020 - 2025	13
Date of the contract: 08.11.2022 **Submission of the final version of the self-assessment report:** 02.04.2024 **Date of the audit (online):** 17.09. – 19.09.2024				
Expert panel: Prof. Dr. Roger Erb, University Frankfurt Prof. Dr. Gabriele Hornung, University Kaiserslautern Prof. Dr. Jörg Zabel, Leipzig University Prof. Dr. Ratu Ilma Indra Putri, Universitas Sriwijaya Medina Andini, Biology teacher, Surabaya				

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 09 – Chemistry; TC 10 – Life Sciences; TC 12 – Mathematics; TC 13 – Physics
[3] National Accreditation Board of Higher Education / Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT)
[4] Lembaga Akreditasi Mandiri Kependidikan (LAMDIK)

Dwika Sarnia Putri, National Tsing Hua University, Taiwan	
Representative of the ASIIN headquarter: Rainer Arnold	
Responsible decision-making committee: ASIIN Accreditation Commission	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014 Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 29.03.2019 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019 Subject-Specific Criteria of Technical Committee 12 – Mathematics as of 09.12.2016 Subject-Specific Criteria of Technical Committee 13 – Physics as of 20.03.2020	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[5]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Sarjana Sains Biologi	Sarjana Pendidikan Biologi (S.Pd.)/ Bachelor of Education in Biology	-	6	Full time	no	8 Semester	145 SKS (230,55 ECTS)	August
Sarjana Sains Kimia	Sarjana Pendidikan Kimia (S.Pd.)/ Bachelor of Education in Chemistry	-	6	Full time	no	8 Semester	145 SKS (230,55 ECTS)	August
Sarjana Sains Matematika	Sarjana Pendidikan Matematika (S.Pd.)/ Bachelor of Education in Mathematics	-	6	Full time	no	8 Semester	144 SKS (228,96 ECTS)	August
Sarjana Sains Fisika	Sarjana Pendidikan Fisika (S.Pd.)/ Bachelor of Education in Physics	-	6	Full time	no	8 Semester	146 SKS (232,14 ECTS)	August

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

For the Bachelor's degree programme Biology Education (UPBE), Universitas Lampung (UNILA) has presented the following vision and mission on its homepage:

	Vision	Mission
UPBE	In 2029, The Undergraduate Programme of Biology Education will become a professional, progressive, and excellent study programme in the development of science and technology in the field of biology education.	1. Organizing Biology education in line with developments in science and technology. 2. Carrying out quality Biology educational and scientific research. 3. Carrying out research-based community service in Biology education and science. 4. Establish cooperation with institutions related to education in and overseas

For the Bachelor's degree programme Chemistry Education (UPCE), Universitas Lampung (UNILA) has presented the following vision and mission on its homepage:

	Vision	Mission
UPCE	In 2029, Programme of Chemicals Education will become a study program whose graduates master theoretical concepts in chemistry based on everyday life phenomena as well as learning that is innovative and adaptive to the development of science and technology.	1. Organizing quality education based on noble character, and in line with developments in science and technology 2. Develop research in the field of creative and innovative chemistry education and learning based on noble character 3. Carry out community service in the field of chemistry education and learning 4. Develop a network of cooperation with related institutions.

For the Bachelor's degree programme Mathematics Education (UPME), Universitas Lampung (UNILA) has presented the following vision and mission on its homepage:

	Vision	Mission
UPME	In 2029, Undergraduate Programme of Mathematics Education will become a professional, progressive, and excellent study programme in the development of science and technology in the field of mathematics education	1. Organizing adaptive and innovative mathematics education and learning based on the results of innovative ideas / works / research math for creativity thinking and school.
		2. Carrying out collaborative and integrative research based on scientific studies and current problems in the field of mathematics education and learning.
		3. Carry out community service activities in the field of appropriate mathematics education and learning based on the results of innovation and research as well as the study of problems in the community
		4. Establishing constructive and sustainable partnerships with governments, communities, businesses, and related institutions at the regional, national, and international levels in the frame of increasing quantity and quality and optimizing the potential of mathematics education resources.

For the Bachelor's degree programme Physics Education (UPPE), Universitas Lampung (UNILA) has presented the following vision and mission on its homepage:

	Vision	Mission
UPPE	In 2029, Undergraduate Programme of Physics Education that produces excellent Physics Education graduates in developing and applying science and technology in the field of Physics Education and is future-oriented.	1. Organizing creative and innovative physics education and learning in order to produce graduates who have new ideas to produce innovative work in the field of physics education and learning based on academic culture and national character values that apply: a) Critical thinking, Collaboration, Communication, Creativity , Compassion, Computational b) Human Literacy, Technology Literacy, Data Literacy.
		2. Developing science and technology in physics education through research to improve the quality of physics education and learning and produce

		the latest scientific products based on local wisdom.
		3. Carrying out research based community service in the fields of physics and physics education as an effort to overcome problems in society.
		4. Establishing sustainable partnerships with communities and related institutions (Universities, schools, and stakeholders) at regional, national and international levels.

C Expert Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Homepage Ba Biology Education: https://biologi.fkip.unila.ac.id/akademik/
- Homepage Ba Chemistry Education: https://kimia.fkip.unila.ac.id/kurikulum/
- Homepage Ba Mathematics Education: https://math.fkip.unila.ac.id/en/curriculum/
- Homepage Ba Physics Education: https://fisika.fkip.unila.ac.id/kurikulum/
- Homepage UNILA: https://www.unila.ac.id/en/
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts base their assessment of the learning outcomes on the information provided on the websites and in the Self-Assessment Report of the four Bachelor's degree programmes under review.

For all four programmes, Universitas Lampung (UNILA) has described and published Programme Educational Objectives (PEO) and Programme Learning Outcomes (PLO). While the PEO are rather general and refer to the vision and mission of the Faculty of Teacher Training and Education (FKIP), the PLO cover a number of specific competences students should acquire in their respective degree programme. The PLO comprise four areas of competence namely attitudes & social aspects, skills, and knowledge. Both, PEO and PLO of each degree programme are published on the respective programme's webpage.

UNILA has defined and published Programme Learning Outcomes (PLO), which cover a number of specific competences students should acquire in the course of their studies. The

PLO comprise four areas of competences namely attitudes, general skills, special skills, and knowledge.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Biology Education, as defined by UNMUL, correspond with the competences as outlined by the SSC. They come to the following conclusions:

Graduates of the Bachelor's degree programme Biology Education should understand the basic biological processes and be capable of applying the scientific and pedagogical methods of the biological sciences. In addition, graduates should acquire relevant scientific knowledge in the different biological areas such as botany, zoology, biotechnology, microbiology, molecular biology, cell biology, and related natural sciences (chemistry, physics). Furthermore, the students should be able to conduct independent laboratory and fieldwork, plan, implement, assess, and follow up the educational biology learning process and be able to design and perform experiments in biology learning to collect, analyse, and interpret data to solve biological issues. Finally, students should be qualified to conduct lifelong learning and work effectively, both individually and in a team, to demonstrate scientific, critical, and innovative attitude in biology learnings, laboratory works, and environmental care.

The Bachelor's degree programme Biology Education is designed to produce competitive graduates with competences to work as biology educators/teachers, who are able to plan, implement, evaluate, and develop modern biology learning. As junior research assistants, graduates should be able to examine issues in biology and biology learning by implementing scientific methods and be able to design and carry out research projects in the area of biology education. As entrepreneurs, graduates should be qualified to manage a business unit and to develop local biological-based business ideas through innovation and creativity.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Chemistry, Pharmacy as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Chemistry Education, as defined by UNILA, correspond with the competences as outlined by the SSC. They come to the following conclusions:

During the course of the Bachelor's degree programme Chemistry Education, students should acquire a basic knowledge of natural sciences and gain methodological and educational competences in the chemical sciences (analytical chemistry, organic chemistry, inorganic chemistry, physical chemistry, and biochemistry) in order to learn about the structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis and characterization of chemicals or complex samples. Furthermore, graduates should also be able to carry out practical work in laboratories and to prepare experiments. Moreover,

students should be familiar with the safe handling of laboratory equipment and chemicals and have knowledge about safety and environmental issues. In addition, graduates should acquire the necessary skills to work scientifically as well as in the field of education, adhering to modern methodologies and theoretical concepts in chemistry learning and teaching. This includes designing, implementing, and evaluating chemistry learning media by utilising Information and Communication Technology. This should qualify graduates to handle chemistry-learning problems and to provide quality chemistry learning that is conducted in classroom or institutions based on scientific data and analysis. Most of the graduates of the Bachelor's degree programme Chemistry Education will find a suitable occupation as high school teachers, managers of educational institutions, junior researchers, or entrepreneurs.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Mathematics as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Mathematics Education, as defined by UNILA, correspond with the competences as outlined by the SSC. They come to the following conclusions:

The intended learning outcomes of the Bachelor's degree programme Mathematics Education focus on conveying scientific and educational methods for observing, understanding, analysing, and solving mathematical problems. To this end, students should develop a mathematical and logical reasoning and be familiar with the different areas of mathematics such as analysis, algebra, applied mathematics, computational mathematics, elementary mathematics, and statistics. Finally, graduates should be able to work with and manipulate mathematical properties and have an understanding of the underlying mathematical concepts. This should enable them to develop critical thinking skills and the ability to use modern mathematical learning and teaching methods. In addition, graduates should be capable to apply and evaluate modern methods and instruments of mathematics learning and teaching by using information and communication technology.

The Bachelor's degree programme Mathematics Education aims at producing professionals who at the beginning of their careers become mathematics educators. However, graduates should also have the ability to be managers of educational institutions and work as entrepreneurs or research assistants.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Physics as a basis for judging whether the intended learning outcomes of the Bachelor's degree programme Physics Education, as defined by UNILA, correspond with the competences as outlined by the SSC. They come to the following conclusions:

The intended learning outcomes of the Bachelor's degree programme Physics Education focus on conveying scientific and educational methods for observing, understanding, analysing, and solving physical phenomena and problems. This includes that graduates should acquire fundamental physics-relevant knowledge of mathematics, computer sciences, and natural sciences. They should understand the concepts, laws, and theories of physics and their application in studying natural processes and phenomena. Furthermore, graduates need to know how to conduct and prepare experiments, including the application of scientific methods, for learning or research purposes. They should also apply the principles of learning safety in physics laboratories and be able to use instruments, teaching aids, calculators, and computer software to improve physics learning in the classroom, laboratory, and field.

In addition, graduates should be capable to apply and evaluate modern methods and instruments of physics learning and teaching by using information and communication technology.

The Bachelor's degree programme Physics Education aims at producing professionals who at the beginning of their careers become physics educators. However, graduates have also the ability to be laboratory managers, employees of educational institutions, entrepreneurs, or research assistants. According to the tracer studies conducted by UNILA, most graduates work as physics teachers in junior high school and senior high school in Indonesia, lecturers in universities, trainers, tutors in informal education institutions, or pursue their Master's degree. Furthermore, some graduates also work in private companies, as civil servants, or become entrepreneurs.

Supplementing the subject-related qualification objectives, students of both Bachelor's programmes should have adequate competences in oral and written communication skills, be capable of working autonomously as well as in a team-oriented manner, and be able to conduct research activities. Furthermore, they should have trained their analytical and logical abilities, are able to apply information and communication technology in the field of education, and show a social and academic attitude. Finally, students should acquire communicative and language skills and should develop a strategy for life-long learning.

According to the tracer studies conducted by UNILA, most graduates work as teachers in secondary schools all over Lampung Province and other areas in Indonesia. Some join Master's degree programmes, teach as lecturers, or become trainers at public educational centers. Students and alumni confirm that graduates mostly work as teachers in senior and junior high schools. However, students also acquire educational competences and competences related to entrepreneurship and research, as some of them are interested in joining Master's or PhD programmes.

In summary, the experts are convinced that the intended qualification profiles of both undergraduate programmes under review allow students to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the goals set for them. The experts conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 09 – Chemistry, Pharmacy (Chemistry Education), of the Technical Committee 10 – Life Sciences (Biology Education), of the Technical Committee 12 - Mathematics (Mathematics Education), and the SSC of the Technical Committee 13 – Physics (Physics Education).

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the experts:
UNILA awards a Bachelor of Education (B.Ed.) or Sarjana Pendidikan (S.Pd.) degree to the graduates of the four Bachelor's degree programmes under review.

The experts confirm that the English translation and the original Indonesian names of the study programmes correspond with the intended aims and learning outcomes as well as the main course language (Bahasa Indonesia).

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plan
- Module descriptions
- Homepage Ba Biology Education: https://biologi.fkip.unila.ac.id/akademik/
- Homepage Ba Chemistry Education: https://kimia.fkip.unila.ac.id/kurikulum/
- Homepage Ba Mathematics Education: https://math.fkip.unila.ac.id/en/curriculum/
- Homepage Ba Physics Education: https://fisika.fkip.unila.ac.id/kurikulum/
- Homepage UNILA: https://www.unila.ac.id/en/

- Discussions during the audit

Preliminary assessment and analysis of the experts:
All four Bachelor's programmes are offered by the Faculty of Teacher Training and Education (FKIP), which is one of the eight faculties at the University of Lampung.

In order to graduate from the Bachelor's degree programmes, Mathematics Education and Physics Education students have to pass a minimum of 144 credits (Satuan Kredit Semester, SKS) within a period of eight semesters (four years). This is equivalent to 228.96 ECTS points). For the Biology Education and Chemistry Education programmes, students have to acquire at least 145 SKS (230.55 ECTS points). The Bachelor's degree programme Physics Education encompasses 145 credits (231.14 ECTS points).

The maximum length of studies for undergraduate programmes at UNILA is 14 semesters (seven years). Each semester is equivalent to 14 weeks of learning activities. Besides these learning activities, there is one week for midterm exams and one week for final exams. The odd semester starts in August and ends in January of the following year, while the even semester lasts from February to July.

The curriculum consists of university requirements and compulsory and elective courses determined by UNILA and the respective departments. University requirements are courses that need to be attended by all undergraduate students at UNILA. There are five university requirements: Bahasa Indonesia, Religion, Pancasila, Entrepreneurship, and Civic Education. These courses are almost all offered in the first two semesters of studies, in addition to courses conveying basic knowledge of natural sciences and mathematics.

The course distribution for the UPBE programme is depicted in the following table:

Course	CU	ECTS	Note
Compulsory Courses	134	213,06	The 134 CU are distributed into 52 compulsory courses including university compulsory courses.
Elective Courses	11	17,49	There are 14 available CU which are distributed into 6 elective courses and students should take at least 11 CU
Total	**145**	**230,55**	

Table 1: Course distribution UPBE, Source: UNILA Self-Assessment Report

The course distribution for the UPCE programme is depicted in the following table:

Types of Courses	CU	ECTS	Note
CU of Compulsory courses	135	214,4	135 CU distributed into compulsory courses

CU of elective courses	10	16	There are 13 elective courses with a total of 28 CU. Students must take at least 10 CU of elective courses from the 28 CU offered
Total	**145**	**230,4**	

Table 2: Course distribution UPCE, Source: UNILA Self-Assessment Report

The course distribution for the UPME programme is depicted in the following table:

Types of Courses	CU	Note
University's Courses	15	University courses are general courses that are required to be taken by all students at the University of Lampung
Faculty's Courses	10	Faculty courses are general courses that must be taken by all students at the Faculty of Teacher Training and Education, University of Lampung
Compulsory courses	109	Compulsory study program courses are courses determined by the study program that must be taken by mathematics education students
Elective courses	10	There are 13 elective courses with a total of 28 CU. Students must take at least 10 CU of elective courses from the 28 CU offered
Total	**144**	

Table 3: Course distribution UPME, Source: UNILA Self-Assessment Report

The course distribution for the UPPE programme is depicted in the following table:

CU compulsory courses	CU	Note
CU of compulsory courses	122	The CU courses are distributed into 122 course units distributed into 46 compulsory courses
Elective courses of 24 - 34 CU can be taken entirely from the curriculum of Undergraduate Programme in Physics Education at the University of Lampung or 6-12 CU outside the Undergraduate Programme within the University of Lampung, and 18-21 credits can be taken outside or inside the University of Lampung	24	There are 102 CU form 34 elective courses. Students take a maximum of 34 CU of the available choices
Total minimum CU	**146**	

Table 4: Course distribution UPPE, Source: UNILA Self-Assessment Report

Courses on the different subject-specific sciences are offered from the third to the eighth semester. Elective courses can be taken from the third year of study. Students usually choose elective courses that relate to their thesis and/or their individual interests. During the eight semesters, students must also complete the research proposal seminar (1 SKS),

thesis result seminar (1 SKS), the undergraduate thesis (4 SKS), and the community service (3 SKS).

To prepare students for practical teaching in secondary schools, there are the PLP (Pengenalan Lapangan Persekolahan) courses, which are mandatory for prospective education graduates with a total work load of 4 SKS. PLP is divided into two courses, namely PLP 1 with a work load of 1 SKS and PLP 2 with a work load of 3 SKS. PLP implementation is carried out in even semesters (period 1: January-May) or odd semesters (period 2: July-November), and the stages of PLP activities are arranged by the PLT Unit. The PLP assessment is carried out by tutor teachers and supervisors from UNILA.

PLP 1 aims to ensure that students become closely acquainted with the school environment in academic, social, physical and administrative terms, so that they can build a foundation of educational identity through observing different forms of teaching activities at partner schools.

PLP 2 aims to enable students to apply basic knowledge and skills of teaching or education in a real situation so that they can learn about curriculum analysis and different form of assessment. In addition, students get to practise teaching and to carry out non-teaching activities.

During the audit the experts learn that also other courses for example “Physics Learning Strategy” require students to go to high schools and observe how teaching is done there. All four undergraduate programmes have similar compulsory courses. The experts appreciate that students are exposed to real teaching in high schools before they conduct the first teaching internship (PLP 1). However, this should be reflected in the respective module descriptions; this is also required for the exam forms used in these modules.

The experts also discuss with the programme coordinators why some students conduct the PLP in elementary schools and not in junior and senior high schools. The programme coordinators explain that there is a high demand for internships from elementary schools and that is why some students conduct the PLP there. If this is done in addition to the compulsory PLP in junior and senior high schools, the experts have no problem with it. Nevertheless, UNILA has to ensure that all students can do their teaching internships in senior or junior high schools and not only in elementary schools. There is a separate degree programme at UNILA for students that want to become teachers at elementary schools and it would be useful if the demand from elementary schools is covered by these students and not by students from programmes that educate teachers for secondary education.

An important issue that the experts discuss in detail during the audit is the fact that currently, students are not sufficiently taught pedagogical content knowledge (PCK). PCK is

essential for teacher education programmes, because it integrates both subject matter expertise and effective teaching strategies. PCK was first described by Shulman (1987). According to Shulman, science teachers need content knowledge (CK), that is scientific expertise in their respective field, as well as general pedagogical knowledge (PK), e.g. about motivation and learning processes. But in addition to these two components, and as a bridge between the two, they also need subject-specific knowledge on how to teach their specific field. E.g. what are the widespread student misconceptions when it comes to genetics, and how can these false ideas be tackled effectively in the classroom? Students should be familiar with PCK, because it allows them to present content in ways that are accessible and meaningful to high school students, tailoring instruction to diverse learning needs. In addition, they will be able to identify students' common misconceptions and learning challenges, creating engaging lessons that promote deeper understanding. PCK bridges the gap between knowing a subject and being able to teach it effectively, ensuring that teachers can help all high school students succeed. However, neither those subjects (like nature of science, international student assessments, conceptual change), nor the application of the Pedagogical Content Knowledge (PCK) model itself can be found in the modules. The UPBE curriculum does contain two modules, “Biology Learning Strategies” and “Biology Learning Design”, which appear to cover PCK. However, the description of these modules and their reference lists contain rather PK (independent of the subject) and only very little PCK. In the “Biology strategy” module, the experts found no modern literature on PCK in biology or science at all. The “Biology design” module description shows only one qualified PCK reference (Loughran, Berry & Mulhall; 2006). For this reason, the experts expect that these topics are implemented in all four degree programmes. This can be realised by upgrading the existing modules, and additionally by offering new modules. A module on PCK in science education, for example, focusing on conceptual change and student misconceptions, could be integrated in all four programmes. The same holds for Nature of Science (NOS) or scientific literacy, which are important concepts for all of the four UP programmes (see next paragraph).

The UBCE programme offers the possibility of including PCK in the training modules for School Chemistry of Classes X, XI and XII (KKM620103, KKM620204 and KKM620214), respectively. It would also be feasible to incorporate PCK into the training modules for mathematics and physics teachers.

The demand for more and up-to-date PCK is closely linked to another observation that the experts made. The curricula of the four programmes are not sufficiently inspired by the international state of the art in science education research. This state of the art is reflected in the major international peer-reviewed journals as well as in international conferences such as ESERA or NARST, to name only two. In the field of science education, major theories

and paradigms have been influential for many decades. The experts illustrate by three examples where the curricula fall behind in this aspect.

One example is the conceptual change approach (Posner et al. 1982, for an overview see Amin & Levrini 2018). Since the 1980s, it has inspired a wide body of empirical studies on what is called student misconceptions and how conceptual learning can be promoted. It is commonly accepted that science teachers should know about common misconceptions in their field, as well as about strategies such as cognitive conflict that are designed to foster the understanding of essential science concepts.

A second example of a state-of-art concept in science education is nature of science (NOS, e.g. McComas 2020). Future teachers should know about the principles of scientific inquiry, they should be able to distinguish the scientific approach from other approaches and a scientific argument from a non-scientific one. This is closely connected to the influential curricular concepts of scientific literacy and science for all, both underlying foundations for the PISA assessments by the OECD and thus major standards in worldwide science education (Bybee 1997). While some of the elements of these curricular concepts are indeed reflected in the module descriptions, e.g. in Biology learning strategy (KBO620206) or Biology learning design, they are nowhere explicitly referred to as NOS or scientific literacy, and no respective literature references are mentioned. The module Biology Learning Strategy seems to come close, but: 1) NOS is not mentioned, and 2) the description does not indicate whether the module contents refer to teaching biology to pupils or to the students themselves.

Third example: Also, the modern concept of SSI (socio-scientific issues) is absent in the curricula. The modules focus on knowledge basically, not on reflection processes and ethical dimension (SSI) and sustainability. Critical thinking as a basic skill and requirement for decision-making in socio-scientific contexts, is not prominent enough in the modules. This is particularly relevant for a country such as Indonesia which faces great environmental challenges such as deforestation, loss of biodiversity at an unknown pace, climate change, and habitat loss.

Because of all these observations illustrated by the three examples, the experts' impression during the audit is that this international state of art has not yet sufficiently reached FKIP, neither the teaching practice at the faculty, nor the staff's research activity. While the staff appears to be very passionate and ambitious about the quality of their teaching, it remains a concern that they do not introduce the students to the global state of the art in this domain. The experts derive this from the reference lists in the modules, which does not contain any cornerstone works of modern science education. Instead, the literature used in the courses, as far as it was visible to us from the documents, is from various other domains

such as general pedagogy and educational psychology. While these works are not irrelevant, they cannot reflect the vast body of knowledge that exists about subject-specific learning obstacles and teaching strategies (PCK, see above). The tradition of best practice in the field of science education has been replaced long ago by empirical studies all over the world, so that is not a matter of taste or of personal experience any more how effective science teaching can be realized. The impression from the documents and the meetings is that UNILA doesn't yet meet this worldwide standard unfortunately. The students should be acquainted with the major theories and frameworks in science education research, as well as socio-scientific issues, and they should write their final projects in the light of this state of the art.

While analyzing the study plans, the experts notice that the module “Marine Biology” in the UPBE programme does not include any practical aspects and only focuses on theoretical topics. The experts point out that all biology teachers, especially in a with a large coastal area, should know about the animal, plant, and microscopic life in oceans in order to be able to teach high school students about the effect of human activities on the planet, including pollution and climate change. To this end, it would be very useful to include a practicum in the course. This would allow students to directly engage with marine ecosystems and organisms, providing experience that complements theoretical knowledge. This way, they can learn how to apply scientific methods in real-world environments, which deepens their understanding of marine processes, species identification, and ecological dynamics. The practicum should include essential skills such as data collection, species sampling, diving, underwater surveying, and lab analysis.

In a similar way, the experts suggest to include practical work in the biochemistry course. They feel that this practical course actually would be beneficial for students to prepare for teaching at secondary schools.

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

the benefit of the community and the Indonesian society during the community service and support this concept.

The members of the teaching staff explain on demand of the experts that they offer possible topics for the final projects according to their own research projects. All members of the teaching staff supervise theses. Students have to design a research proposal (this proposal is developed in the "proposal seminar", which usually takes place in the sixth semester) with a time schedule for the project, which is discussed with the academic advisor. If they agree, students apply formally for being allowed to work on the suggested topic. Students can also develop their own concepts for their Bachelor's thesis. As the research projects at FKIP focus on science education, the theses are also dealing with educational topics.

Students who have strong reasons, such as illness or pregnancy, are entitled to take academic leave for a maximum of two semesters without paying tuition and still counting as the study period. Academic leave is proposed by students to the Dean, who then submits a proposal for academic leave to be determined administratively by the Rector's Office.

The experts point out that all four undergraduate programmes under review need to ensure that essential subjects such as molecular biology, bioinformatics, artificial intelligence, big data, and green chemistry are part of the curriculum of the respective degree programme. The courses may be set up as collaborative courses with the Faculty of Mathematics and Natural Sciences. Even if these subjects are not taught to high school students, it is important that teachers are familiar with them, as they play a vital role in understanding natural sciences and current developments in this area.

International Mobility

UNILA provides some opportunities for students to conduct internships and exchange programmes abroad. Students who take part in student exchanges through cooperation programmes can gain recognition of the acquired credits after obtaining approval from their undergraduate programme. The credits acquired abroad are transferable to UNILA, although this transfer of credits is only possible if an agreement exists between UNILA and the involved international university. This agreement regulates the details of the transfer, such as the list of courses that can be transferred, the minimum grade, equivalency of curriculum between universities, etc..

In addition, students of educational programmes can join the SEA Teacher (Southeast Asia-Teacher) project. This programme was initiated by the Southeast Asia Ministers of Education Organisation (SEAMEO) involving countries in Southeast Asia. Eleven SEAMEO member countries are collaborating on this project that is aimed to improve the quality of education

in Southeast Asia, revitalize teacher education, and continue to build and improve the quality of teachers in their home country. The Faculty of Teacher Training and Education of UNILA participates at the SEA Teacher programme. In the SEA Teacher programme, FKIP has international cooperations with universities in Malaysia (for eight students) and the Philippines (for six students). The students usually stay for four weeks abroad.

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

The new policy of the Indonesian government actively supports any activities outside of the university by releasing a regulation on the Merdeka Belajar-Kampus Merdeka (MBKM), which requires the university to promote students who want to spent part of their Bachelor's programme outside UNILA (Minister of Education and Culture Regulation Number 3, Year 2020). UNILA recognizes the courses taken by the students outside UNILA, based on the comparability of the intended learning outcomes. The experts consider this regulation sufficient.

The International Office of UNILA is responsible for managing and coordinating the international activities such as coordinating and managing student mobility programmes, developing and maintaining relationships with partner institutions and organisations around the world, recruiting and admitting international students, providing support and assistance to international students during their time at UNILA, such as helping with housing, visa issues, and other practical matters.

The number of students in the four undergraduate programmes, who spend some time abroad is still quite low despite students' high interest. Several students take part at the MBKM programme every year, but all of these stays were conducted in Indonesia in the context of teaching in educational institutions, projects in villages, or short term stays at other universities. As shown in the following table, only few students study abroad:

No	Programme	Number of Students	Year	Undergraduate Programme
1	Indonesian International Student Mobility Awards (IISMA): Sea Teacher Batch 9	2	2023	UPME and UPPE

2	Indonesian International Student Mobility Awards (IISMA): Sea Teacher Batch 5	4	2018	UPME, UPPE, UPBE, UPCE
3	Indonesian International Student Mobility Awards (IISMA): Sea Teacher Batch 4	2	2017	UPCE and UPBE

Table 5: Academic Mobility, Source: SAR UNILA

The students confirm during the discussion with the experts that some opportunities for international academic mobility exist and that the credits acquired abroad are recognised at UNILA. The experts especially appreciate that since this year UNILA has a dedicated budget for students' academic mobility. UNILA will provide around 100 students with IDR 10 million each for studying abroad. This means that about 15 students from each Faculty (there are eight Faculties at UNILA) will be chosen. The main selection criteria are GPA, social activities, and English proficiency. This new programme is coordinate by the International Office of UNILA

The experts emphasize that it is very useful for students to spend some time abroad already during their Bachelor's studies to improve their English proficiency, to get to know other educational systems, and to enhance their job opportunities.

To attract international students, FKIP should think about regularly conducting international summer schools. The experts are convinced that such an offer would appeal to many students, especially from Europe, and this might help to further promoting the internationalisation of UNILA. To this end, they appreciate that FKIP is planning to organize an international summer school in 2025.

A good starting point for initiating more international co-operations are the personal international contacts of the faculty members and the guest lecturers. It is also possible for students and teachers to apply to international organisations like the German Academic Exchange Council (DAAD) or British Council for receiving funds for stays abroad. In addition, FKIP should invite more academics from renowned international universities as guest lecturers. Additionally, the teachers would like to have more support from UNILA and FKIP on establishing international contacts and cooperations in the area of teacher education. Moreover, it would also be useful to provide better financial support for teachers who want to attend international conferences or workshops. The experts emphasise that all teachers should be familiar with the state-of-the-art in science education and keep in touch with the

respective international community. To this end, it is necessary that they have the opportunity to attend international workshops and conferences on current topics in science education.

Since UNILA has the goal to become internationally more visible and wants to further internationalise its degree programmes, the experts discuss with the programme coordinators and students if any classes in the four undergraduate programmes are taught in English. The programme coordinators explain that most courses are delivered in Bahasa Indonesia (Indonesian language) but most of the teaching materials are provided in English and some presentations by students are also done in English. Furthermore, the research proposal seminar is conducted in English and some electives are already taught partly in English. During the audit, the Dean explains that FKIP is planning to teach some classes bilingual (English and Bahasa) from the next academic year by matching teachers with high and low English proficiency in the same class. The experts appreciate the effort to introduce more classes that are taught in English. However, with respect to English proficiency, the experts emphasise that delivering part of the lectures in English is highly encouraged and teachers should be supported to be fluent in communication in the English language.

In summary, the experts appreciate the effort to foster international mobility and support FKIP to further pursuing this path. However, the academic mobility is still low and there is room for improvement.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Study plan
- Homepage Ba Biology Education: https://biologi.fkip.unila.ac.id/akademik/
- Homepage Ba Chemistry Education: https://kimia.fkip.unila.ac.id/kurikulum/
- Homepage Ba Mathematics Education: https://math.fkip.unila.ac.id/en/curriculum/
- Homepage Ba Physics Education: https://fisika.fkip.unila.ac.id/kurikulum/
- Homepage UNILA: https://www.unila.ac.id/en/
- Discussions during the audit

Preliminary assessment and analysis of the experts:

According to the Self-Assessment Reports, admission procedures and policies for new students follow the national regulations in Indonesia, specifically the Permendikbud Number

6/2020 regulation about the “New Student Admission Scheme for Public University” and the “Standard Operational Procedure of the UNILA for New Students Enrolment”. The process is based on regulations that are issued by the Rector every year, which determine the selection pathways, assessment mechanisms, available study places, and registration processes. The requirements, schedule, registration venue, and selection test are announced on UNILA’s webpage and thus accessible for all stakeholders.

There are several different ways by which students can be admitted to a Bachelor’s programme at UNILA:

1. National Entrance Selection of State Universities (Seleksi Nasional Berdasarkan Prestasi, SNBP), a national admission system, which is based on the academic performance during the high school.

2. Joint Entrance Selection of State Universities (Seleksi Nasional Berbasis Tes, SNBT). This nationwide computer-based written test (UTBK) is held every year for university candidates. It is a nationwide online test (subjects: Mathematics, Bahasa Indonesia, English, Physics, Chemistry, Biology, Economics, History, Sociology, and Geography), which may be supplemented with other criteria according to the regulations set by the different universities (Academic State Universities, Vocational State Universities, or State Islamic Universities.

3. Independent Selection (Seleksi Mandiri Masuk Perguruan Tinggi Negeri Bagian Barat, SMMPTN) students are selected based on a test specifically held by UNILA and other universities in Sumatra for prospective students that haven not been accepted through SNBT or SNBP.

4. Students Expansion Admission (Penerimaan Mahasiswa Baru Perluasan Akses Pendidikan, PMPAP) is an independent admission intended for prospective students from less prosperous families, but academically capable who come from senior high schools in Lampung Province.

Moreover, there are special admission criteria for international students, for students with special needs, and for students with high achievements e.g. in academics, sports, arts or other competitions.

The Higher Education Entrance Test Institute (Lembaga Tes Masuk Perguruan Tinggi, LTMPT) carries out the process of student data collection, registration, and implementation of university entrance selection in Indonesia on the national level. At UNILA, the New Student Admissions Management Agency (Badan Pengelola Penerimaan Mahasiswa Baru, BP

PMB) is in charge of carrying out the admission procedure. All information about the requirements, how to register, the stages of the registration process, exam schedules, and announcement of selection results are managed by this agency.

In general, UNILA implements four student recruitment methods, namely SNBT, SNBP, SMMPTN, and PMPAP with a 50%, 30%, 10%, and 10% quota respectively. This is based on an official UNILA regulation from 2022. Provisions regarding the selection mechanism for new student admissions can be accessed via the UNILA homepage (https://sima-nila.unila.ac.id/), which can be accessed by all prospective students both domestically and abroad. Apart from information regarding entrance selection, the website also provides information about service standards and mechanisms for carrying out lecture activities as outlined in academic guidelines.

Since 2020/21, the number of registered students has continually increased. For example, in 2020/21 283 new students were enrolled and in 2022/23 453 new students. The number of available study places is 100 students per year in each of the four Bachelor's degree programmes; it is based on the number of teachers and the capacity of the available facilities.

The average number of new students in the mathematics education (97), physics education (84), chemistry education (85) and biology education (104) undergraduate programmes from 2020 to 2022 was slightly above the maximum capacity. However, the number of applications exceeds the number of available study places by far. For example, in 2020/21, 780 persons applied for the Mathematics Education programme and only 72 were accepted. This results in an acceptance quota of 9.2 %. The Biology Education programme receives the most applications (1012 in 2022/23). Out of this higher number, 133 students enrolled in the programme, which results in an acceptance quota of 13.1 %.

On the other hand, the Physics Education and Chemistry Education programmes have a higher acceptance quota. In 2020/21, 391 students applied for the Chemistry Education programme, of which 70 were enrolled, which results in an acceptance quota of 17.9 %. The Physics Education programme has the highest acceptance quota (21.5 %), here 409 students applied in 2020/21, of which 88 were enrolled

The details are depicted in the following table:

UPME													
Year of Entrance	SNBP		SNBT		SMMPTN		PMPAP		Special needs		Special achievements		Enrolled
	Applied	Offered	Applied	Offered	Applied	Offered	Applied	Offered	Applied	Offered	Applied	Offered	
2020/2021	352	20	333	44	34	13	54	3	1	1	6	2	72

2021/2022	337	28	269	67	11	6	66	3	0	0	3	2	96
2022/2023	341	45	315	87	19	10	50	3	0	0	4	2	124
UPPE													
Year of Entrance	**SNBP**		**SNBT**		**SMMPTN**		**PMPAP**		**Special needs**		**Special achievements**		**Enrolled**
	Applied	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	
2020/2021	128	20	80	44	35	11	26	3	9	6	0	2	65
2021/2022	118	28	131	67	80	11	66	3	11	6	3	2	88
2022/2023	148	45	112	82	23	7	19	2	4	3	0	2	100
UPCE													
Year of Entrance	**SNBP**		**SNBT**		**SMMPTN**		**PMPAP**		**Special needs**		**Special achievements**		**Enrolled**
	Applied	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	
2020/2021	191	20	153	52	17	7	28	3	0	0	2	0	70
2021/2022	180	28	108	67	35	1	2	2	0	0	0	0	84
2022/2023	159	45	110	75	4	3	0	0	1	1	0	0	102
UPBE													
Year of Entrance	**SNBP**		**SNBT**		**SMMPTN**		**PMPAP**		**Special needs**		**Special achievements**		**Enrolled**
	Applied	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	**Applied**	**Offered**	
2020/2021	336	28	301	67	124/33	16	67	3	0	0	67	4	76
2021/2022	378	20	325	44	104/25	15	107	4	0	0	107	4	102
2022/2023	420	45	373	87	27	15	96	4	0	0	96	23	133

Table 6: New Students' Admission, Source: UNILA Self-Assessment Report

The experts see that all the Bachelor's degree programmes under review receive many applications and the demand is much higher than the number of available study places.

Undergraduate students at UNILA have to pay tuition fees (UKT). The fees for each study programme vary according to the operational costs of learning. In addition, UKT for each student is different according to the financial ability of their parents. Students with a very weak economic background do not have to pay any tuition fees (group I) and the highest tuition fee (group VIII) is IDR 6,250,000 (EUR 365) per year. The average UKT for the eight groups is IDR 3,343,750 (EUR 195).

The details are shown in the following table.

Undergraduate Program	**Students Allowance (UKT) in Rupiah (Every Semester)**							
	Group I	**Group II**	**Group III**	**Group IV**	**Group V**	**Group VI**	**Group VII**	**Group VIII**

UPME, UPPE, UPCE, and UPBE	0	1,000,000	2,400,000	3,150,000	3,900,000	4,650,000	5,400,000	6,250,000

Table 7: Tuition Fees, Source: SAR UNILA

Several grants for students with financial difficulties are available, such as from the government, industries, and foundations.

From their discussion with the students, the experts gain the impression that the admission system is very effective and only very motivated and high-performing candidates are admitted. The experts consider the highly selected and motivated students to be one of the strong points of the four Bachelor's programmes under review.

In summary, the experts find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

Criterion 1.5 Work load and credits

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:
Based on the National Standards for Higher Education of Indonesia (SNPT), all four programmes under review use a credit point system called SKS.

For regular classes, 1 SKS of academic load for the undergraduate programme is equivalent to 3 academic hours, which equals 160 minutes. This includes:

- 50 minutes of scheduled contact with the teaching staff in learning activities,
- 60 minutes of structured activities related to lectures, such as doing the assignments, writing papers, or studying literature,
- 60 minutes of independent activities outside the classroom to obtain a better understanding of the subject matters and to prepare academic assignments such as reading references.

For lab work, final project, fieldwork, and other similar activities, 1 SKS is equivalent to 170 to 200 minutes a week of student's activities. The details and the students' total workload are described in the respective module description.

Bachelor's students with high academic achievement can take more courses (up to 24 SKS) to speed up their studies; the academic advisor must approve this.

According to the Self-Assessment Report, UNILA uses a fixed conversion factor of 1.59 between SKS and ECTS points. The reasoning behind this calculation is that one SKS equals 170 minutes (2.83 hours). As the semester lasts for 14 weeks 2.83 x 14 = 39.67 hours per semester. As UNILA calculates 25 hours of students' workload for one ECTS point, this total workload is then divided by 25 to get the conversion factor: 39.67 / 25 = 1.59.

The experts point out that there can be no fixed conversion rate between SKS and ECTS points. Therefore, the ECTS points need to be calculated separately for each course. This is necessary, because the time students need for self-studies is different for each course. Especially the courses with the high share of self-studies (KKN, PLP, and Bachelor's thesis) show, that the students spend much more time on their final projects than is currently reflected in the awarded ECTS points. UNILA should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations). In other words, a seminar and a lecture may require the same number of contact hours, but one may require significantly greater workload than the other because of differing amounts of independent preparation by students.

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

Since the workload of the students was only estimated by the programme coordinators and seems to be too low in comparison to the actual time needed by the students, the experts ask UNILA to verify the students' total workload and to adjust the awarded ECTS points. This could e.g. be done by including a respective question in the satisfaction questionnaires. In any case, UNILA must make sure that the actual workload of the students and the awarded ECTS credits correspond with each other and make that information transparent in the module descriptions and the study plans.

With respect to the average time students need to graduate from the programmes, the experts notice that the average length of studies exceeds the expected eight semesters. However, the programme coordinators explain that several senior students already work as teachers, even before finishing the degree programme, because the demand is high and

the students need the payment. This results in some study delays and students do not finish in the expected eight semesters. The experts are satisfied with the explanation and see no need to issue any recommendations or requirements on this point.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Self-Assessment Report
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Various teaching and learning methods such as lectures, class and group discussions, case studies, demonstrations, assignments, simulations, experiments, field studies, teaching practise, and problem-based learning are applied in all four undergraduate programmes under review. Structured activities include homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership. The assignments and exercises should help students to develop their abilities with respect to critical thinking, written/oral communication, data acquisition, problem solving, and presentations.

Students are further encouraged to apply their knowledge in a series of student projects that are oriented towards teaching practice in the classroom and in laboratories. Classes and laboratories are designed in problem-based learning settings in order to introduce student-oriented teaching methods to involve all students in the learning processes and to develop their thinking and analytical skills. Problem based learning and student-centred learning is used in several courses and students are assigned to group projects and have to present their findings in front of the class. In addition, teaching practice in form of school internships is also part of the curriculum. Moreover, students gain practical experience through the PLP (Field School Internship) and KKN (Student Community Service) activities that integrate teaching practice with community service, so that students are expected to be able to identify, analyse and solve problems in the school and its environment.

The most common method of learning is class session, with several courses having integrated laboratory work. Lecturers generally prepare presentations to support the teaching process. In addition, several courses include teaching practice sessions or micro-teaching (i.e. students presenting teaching practice trials in front of their peers). With individual or

group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre- or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods. All students at UNILA have access to the digital academic information system (Sistem Informasi Akademik, SIAKADU). The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via SIAKADU. In addition, course materials and supporting documents compiled by the lecturers are provided via SIAKADU. For online learning processes, UNILA provides a digital platform called "UNILA Virtual Class", which can be accessed by all students and lecturers.

The experts point out that in order to keep up with the latest trends like STEAM, STEAM, contextualization, and modelling, FKIP needs to update the content and teaching methods. This update is important to ensure that students are learning the most relevant skills and have knowledge about current topics. Moreover, the experts miss subject-specific media and learning tools for sciences, e.g. digital microscope, simulation & modelling of ecosystem dynamics (predator-prey), biodiversity-related apps for species identification, spreadsheet for analysing data and so on.

Otherwise, the experts consider the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concept of all four undergraduate programmes comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

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

The experts are pleased that UNILA has conducted a curriculum workshop with all four study programs in order to revise the curriculum. They also appreciate that UNILA will update the module descriptions and the form of learning evaluation in all courses related to PLP. The experts expect UNILA to submit the revised module descriptions and curricula in the further course of the procedure. This includes updated information on the implementation of Pedagogical Content Knowledge (PCK) in the relevant courses.

The experts emphasise their opinion that all students of the four study programmes should do their teaching internships in senior or junior high schools and not only in elementary schools.

The experts appreciate that FKIP has established several cooperations with universities abroad and they support the effort to increase the budget for international student mobility. It is certainly a good idea to take part at international summer schools, but FKIP should also try to offer one on their own.

The experts consider criterion 1 to be mostly fulfilled.

2. Exams: System, concept and organisation

Criterion 2 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions
- UNILA Academic Guidelines

Preliminary assessment and analysis of the experts:

According to the Self-Assessment Reports, the students' academic performance is evaluated based on written exams (e.g., multiple choice, essays, quizzes, and calculations), oral exams, presentations, practical work, papers, and reports.

The teaching team can perform assessment techniques in the form of observation, participation, performance, written tests, and oral tests. The result of the assessment is obtained from the integration of the various assessment techniques and instruments used.

Assessment of learning processes and outcomes can be done in the form of quizzes, structured assignments, practicum exams, mid-semester exams, end-of-semester exams, and classroom observations. In the practical work, students are required to make a report on the observations that are evaluated by a laboratory assistant. Students are required to attend at least 80 % of the lectures and have to participate in all practical activities.

The form of each exam is mentioned in the module descriptions that are available to the students via UNILA's homepage and the digital platform SIAKADA. Usually, there are two written exams in each course (besides the assignments, homework, and presentations);

the mid-term exam is conducted in 8th week of the semester and the final exam in 16th week.

Supplementary examinations or substitutes are permitted for students who have valid reasons (such as illness as evidenced by a doctor's letter or for students with disabilities or other limitations with compensation agreed upon individually) after obtaining approval from the respective teacher.

All stages of the learning assessment results are announced to students to be checked for correctness. If there is an error by the lecturer in giving grades, students can apply for correction of grades to the teacher by bringing evidence in the form of exam files and structured assignments. Students can access their grades at any time through SIAKADU.

Students' academic achievements are evaluated at the end of the semester; they can continue studying if they have completed a minimum of 40 SKS with a minimum GPA of 2.00 at the end of the fourth semester 4, and a minimum of 80 SKS with a minimum GPA of 2.00 at the end of eighth semester. In semester 14, if students do not meet 144 SKS and a GPA of 2.00 then they have to drop out because the study period has ended. If a student fails a course in a certain semester, the student can re-take the course at the next opportunity. Students are given twice the opportunity to re-take failed courses. If students still fail, they will be facilitated with a remedial course called "Studi Terbimbing". Which means that students attend an additional coaching course in order to prepare them for passing the final exam.

Each of the grades carries a numeric value for the purpose of calculating a weighted average on a 4.00 scale. These values are indicated below:

Final score (0-100)	Quality Letters	Quality Score	Assessment Status
grade ≥ 76	A	4,0	Passed
71 ≤ grade < 76	B+	3,5	Passed
66 ≤ grade < 71	B	3,0	Passed
61 ≤ grade < 66	C+	2,5	Passed
56 ≤ grade < 61	C	2,0	Passed
50 ≤ grade < 56	D	1,0	Passed*
grade < 50	E	0,0	Not Passed

Table 8: Numeric value of the grades, Source: SAR UNILA

Students in the final year are required to complete a final project (bachelor's thesis) by conducting research according to their field of interest. Each student will be guided by two

supervisors who are determined by the Head of the Study Programme according to their expertise. The thesis includes writing a proposal in the seminar, preparing the written thesis, and presenting the results in the thesis seminar. The research topic should be relevant to the expertise of the supervisor and co-supervisor and focuses on educational topics. Students can also choose research topics according to their interests. The list of names of students taking part in the thesis proposal seminar can be obtained from SIAKADU.

The assessment of the thesis is carried out in three stages: 1) assessment of the proposal seminar; 2) seminar assessment of final research results; and 3) comprehensive exam assessment. Student research proposals are evaluated through a proposal seminar attended by two supervisors and one lecturer. The research results seminar is held after completing the research and making a research report. The final grade is based on the quality of the written thesis, literature review, research methods, originality of ideas, and performance in the seminars such as media quality, presentation skills, and discussion abilities.

As part of the on-site visit, the experts also inspect exemplary examinations as well as Bachelor's theses from all courses of study. Overall, they are satisfied with the quality of the examinations and theses.

Relevant rules for organizing and conducting examination, assessment criteria, procedures in case of re-sits, disability compensation measures, proceedings in case of illness and other mitigating circumstances are transparently put into legal regulations. Students and lecturers confirm in discussions that both sides are aware of the regulations, and the experts have the impression that this system is operative with the aim to meet the requirements of the students as far as possible. In discussions, students describe the organization of examinations as transparent and responsive to their needs. This judgment explicitly includes the policy of retaking the course in the case of a failure.

By studying the Self-Assessment Report and from discussions during the audit, the experts gain the impression that the methods used by the teaching staff at the Faculty of Teacher Training and Education for assessing learning outcomes are mostly appropriate. The examination methods depend on the subject and the intended learning outcomes and range from mid-term and final examinations, laboratory works to subject-specific assignments and projects. The exams are usually written exams (e.g. quizzes, essay questions, calculation problems, or multiple-choice questions). There are only a few oral exams, for example for presenting the final project. With respect to the professional profiles of the four programmes, the proportion of oral exams could be increased, particularly when it comes to PCK content and teaching methods.

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

The experts thank UNILA for explaining that there are several courses that use oral exams, for example microteaching, research essay proposal, research essay result, and research essay. In addition, in each study programme there are also courses that require oral presentations. However, the experts think that this could be increased, especially in advanced courses.

The experts consider criterion 2 to be fulfilled.

3. Resources

Criterion 3.1 Staff and Development

Evidence:

- Self-Assessment Report
- Staff Handbook
- Study plan
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

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

The academic staff members involved in the UPBE include 13 permanent faculty members. The active student population in UPBE is 379 students (odd semester 2022/23). The teacher-to-students ratio is 1:29, with an average workload per semester of 13.7 credit hours for lecturers. Issues related to the high lecturer-to-student ratio and the high average workload are addressed by implementing resource sharing with the Biology Department in the Faculty of Mathematics and Natural Sciences. With the involvement of three shared

faculty members, the teacher-to-student ratio is reduced to 1:24. The UPBE teachers includes 4 associate professors, 5 lecturers, and 4 assistant lecturers. 54 % of the teachers in UPBE have a doctoral qualification and 46 % hold a Master's degree.

As mentioned in the Self-Assessment Report, there are currently 15 academic staff members who are teaching courses in UPCE. The average number of students in the last three years was 348, so the teacher-to-student ratio is 1: 24. The lecturers' workload in the last year was between 12 and 16 credits hours. The teaching staff in UPCE includes 2 full professors, 7 associate professors, 1 lecturer, and 6 assistant lecturers. Of the 15 academic staff members, 6 have a doctoral degree and 9 hold a Master's degree.

According to the Self-Assessment Report, the number of active undergraduate students in UPME is 401 students (Odd Semester 2022/2023). The total number of lecturers in UPME is 16 lecturers (1 full professor, 4 associate professors, 5 lecturers, and 6 assistant lecturers). This results in a teacher-to-student ratio of 1:25. 50 % of the teachers in UPME have a doctoral qualification and 50 % hold a Master's degree.

UPPE has 16 permanent academic staff members with 50 % holding doctoral qualifications and 50 % holding Master's degrees. The faculty members include 3 full professors, 4 associate professors (25%), 3 lecturers, 4 assistant lecturers, and 2 supporting teaching staff. With a total of 16 faculty members and 285 active students in the even semester of 2022/2023, the teacher-to-student ratio is 1:18. The average workload for faculty members is 15.8 credit hours per semester.

Details of the academic qualifications of the teachers are described in the staff handbook, which is accessible via the programme's webpage. All fulltime members of the teaching staff are obliged to be involved in (1) teaching/advising, (2) research, and (3) community service. However, the workload can be distributed differently between the three areas from teacher to teacher. In addition, there are non-academic staff members consisting of librarians, technicians and administrative staff.

During the audit, the experts ask why there is no full professor in the Biology Education programme. The experts learn that the requirements for becoming a full professor in Indonesia are based on research activities, publications, academic education, supervision of students, and other supporting activities. These requirements have the consequence that for "young" faculties, as the Biology Education programme, it is very hard to have already produced a full professor. The experts understand that the teachers still need some time before they are able to apply to the position of a full professor. However, during the audit, the experts learn that one teacher from the Biology Education programme has already applied for promotion to full professor. The experts see that the university is supporting its

teachers to become full professors and support UNILA and especially FKIP in further pursuing this path.

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

During the audit, the experts inquire how high the teaching load is and if enough opportunities are offered to the academic staff members to conduct research activities. They learn that teachers at FKIP have a workload of 12 to 16 credits; the national maximum is 16 credits. One credit is equivalent to 170 minutes of work per week with about one hour contact time. How much time staff members actually devote to research is different from teacher to teacher, because working hours are spent flexibly for teaching, research, and community service.

In summary, the experts confirm that the composition, scientific orientation and qualification of the teaching staff – beside the already mentioned points – are suitable for successfully implementing and sustaining the degree programme.

Staff Development

UNILA encourages training of its academic and technical staff for improving the educational abilities and teaching methods. As described in the Self-Assessment Report, faculty members attend courses in English language training, Information and Communications Technology, laboratory safety and instrumentation, writing publications, and e-learning.

Furthermore, staff members are required to obtain the PEKERTI (Program Peningkatan Keterampilan Dasar Instruksional) certificate or the Applied Approach certificate. This is a compulsory training for all staff members that focuses on advancing pedagogical knowledge. It is designed particularly for junior faculty members to introduce various teaching methods, learning strategies, preparation of assessments, class management, as well as syllabus and course content development. All teachers at UNILA are obligated to attend the lecturer certification programme held by the Directorate General of Higher Education (Direktorat Jenderal Pendidikan Tinggi Ditjen, DIKTI). An official teaching certificate is issued after the faculty member has completed the certification process. In addition, the study programmes organise trainings to upgrade lecturers' pedagogical content knowledge on a regular basis.

Young staff members with a Master's degree are encouraged to pursue doctoral studies (usually abroad). To support this policy, UNILA provides foreign language training and organises seminars presenting scholarships from various sources.

Lecturers' professional development in pedagogical and professional skills is conducted through workshops, webinars, and seminars both within and outside UNILA. Respective data for each lecturer is recorded in the SISTER system and one of the assessment components of lecturers' BKD (Career Development Evaluation. To enhance faculty members' competence in languages, UNILA facilitates various programs organised by the Language Center (UPT Bahasa), including training sessions such as "Communication Skill for English IELTs and TOEFL". However, during the discussion with the experts, the members of the teaching staff point out that they wish for better support with respect to writing scientific publications and submitting them to renowned journals in order to help them to reach the next academic level and become full professors in the end. This refers to increased financial support as well as to courses on how to better write scientific publications and where to submit them. The experts explicitly support this wish. However, to increase the ability to be part of the research community, the colleagues should also attend international conferences in science education.

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

Student Support

UNILA offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is responsible for approximately 20 students from her/his classes. He/she is the student's first port of call for advice or support on academic or personal matters.

The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. During the semester, counselling activities are usually offered three times, namely at the beginning of the semester (before the courses start), mid-semester, and at the end of the semester. The students confirm during the discussion with the experts that they all have an academic advisor, whom they can approach if guidance is needed.

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

The fourth-year students who prepare their final project (mini-thesis) usually have two supervisors, who are selected based on the topic of the final project. One supervisor could be an external supervisor, if the student performs the final project outside UNILA. The thesis supervisor is responsible for providing advice and guidance to students in determining research topics, writing proposals, supervising the implementation of research, writing reports, and assisting students in presenting their research results.

All students at UNILA have access to the digital academic information system (Sistem Informasi Akademik, SIAKADU). The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via SIAKADU. In addition, course materials and supporting documents compiled by the lecturers are provided via SIAKADU.

To help students finding suitable jobs after graduation, UNILA has established the Center for Career and Entrepreneurship Development (CCED), which announces job vacancies and opportunities to students, offers career guide and coaching, provides psychological support, and conducts alumni surveys.

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

The experts notice the good and trustful relationship between the students and the teaching staff; there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them.

Criterion 3.2 Funds and equipment

Evidence:

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

Preliminary assessment and analysis of the experts:

Basic funding of the undergraduate programme and the facilities is provided by UNILA and FKIP. The financial sources are government funding (BOPTN, Bantuan Operasional Perguruan Tinggi Negeri - Operational Assistance for State Universities), tuition fees from students (UKT), and business units. According to the information provided during the audit, 39 % of the university's budget is derived from the government, 51 % from tuition fees, and the rest comes from business units. The planning of fund utilisation is prepared one year before its implementation, allowing for an estimation of the required amount of funds for the current year. The obtained funds are categorized as HR investment costs, facility investment costs, and infrastructure investment costs. Funds allocated for HR investment include workshops, research activities, community service, student affairs, and scientific journals. Additional funds for research activities can be provided by UNILA or the Indonesian government (Bantuan Pendanaan Perguruan Tinggi Nasional, BPPTN), but the teachers have to apply for them.

The annual budget of the Faculty of Teacher Training and Education is determined at university level. Every year, UNILA's management will ask the faculties to prepare an activity plan and a budget for the next period. The activity and budget planning is presented and discussed during the management meetings at faculty level, and subsequently forwarded to UNILA's management.

The provided budget allows the departments to conduct the study programme as well as some specific activities, including student exchange programmes, student financial assistance for research, and participation in international conferences. The academic staff members emphasise that from their point of view, the programmes under review receive sufficient funding for teaching and learning activities.

The available funds for the four undergraduate programmes are depicted in the following tables:

No.	Type of Use	UP (in Million Rupiah)			
		Biology Education			
		2020	2021	2022	Average
1	Education Operational Costs	188,52	38,50	50,05	92,36
a	a. Lecturer Fees (Salary, Honoraria)	585,14	393,74	387,64	455,50
b	b. Education Personnel Costs (Salary, Honoraria)	164,57	110,74	109,02	128,11
c	c. Learning Operational Costs (Consumable Materials and Equipment)	16,97	26,69	21,02	21,56
d	d. Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities Maintenance, Overtime Pay, Telecommunications, Consumption, Local Transport, Taxes, Insurance, etc.)	163,60	118,62	108,68	130,30
2	Student operational costs (reasoning, interests, talents and welfare).	39,62	21,06	23,60	28,10
Total		**1.158,42**	**709,35**	**700,01**	**855,92**
3	Research costs	60,20	45,95	46,44	50,86
4	Community service costs	22,32	17,33	15,45	18,37
Total		**82,52**	**63,28**	**61,89**	**69.23**
5	Human resource investment costs	80,58	65,80	52,30	50,86
6	Investment Facility costs	79,78	62,01	96,61	18,37
6	Infrastructure Investment Costs	123,31	125,46	111,14	69,23
Total		**283,67**	**253,27**	**260,05**	**138,46**

Table 9: Available Funds UPBE, Source: SAR UNILA

No	Type of Use	UPCE (in Million Rupiah)			
		2020	2021	2022	Average
1	Education Operational Costs	131,79	141,68	38,50	103,99
	a. Lecturer Fees (Salary, Honoraria)	583,51	439,73	393,74	472,33
	b. Education Personnel Costs (Salary, Honoraria)	128,09	123,67	110,74	120,83
	c. Learning Operational Costs (Consumable Materials and Equipment)	42,71	12,75	26,69	27,38
	d. Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities Maintenance, Overtime Pay, Telekomunikasi, Consumtion, Local Transport, Taxes, Insurance, etc..)	111,92	122,94	118,62	117,83
2	Student Operational Costs (reasoning, interest, talents, and welfare).	58,65	29,78	21,06	36,50
Total		**871**	**709**	**700**	**760**
3	Research Costs	45,24	45,95	46,44	45,88
4	Community service Costs	16,77	17,33	15,45	16,52
Total		**63**	**62**	**63**	**62,67**
5	Human resource investment costs	60,55	65,80	52,30	59,55
6	Investment Facility costs	59,96	62,01	96,61	72,86
7	Infrastructure Investment Costs	92,66	125,46	111,14	109,75
Total		**213**	**253**	**260**	**242**

Table 10: Available Funds UPCE, Source: SAR UNILA

No.	Type of Use	UPME (in millions Rupiah)			
		2020	2021	2022	Average
1	Education Operational Costs	208,55	38,50	50,05	99,03
	a. Lecturer Fees (Salary, Honoraria)	647,29	393,74	387,64	476,22
	b. Educational Staff Costs (Salary, Honoraria)	182,05	110,74	109,02	133,93
	c. Learning Operational Costs (Consumable Materials and Equipment)	18,77	26,69	21,02	22,16
	d. Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facility Maintenance, Overtime Pay, Telecommunications, Consumption, Local Transportation, Taxes, Insurance, etc.).	180,97	118,62	108,68	136,09
2	Student operational costs (reasoning, interests, talents and welfare).	43,83	21,06	23,60	29,49
Total		**1.281,46**	**709,35**	**700**	**896,94**
3	Research Costs	66,59	45,95	46,44	52,99
4	PKM's Costs	24,69	17,33	15,45	19,15
Total		**91,28**	**63,28**	**61,89**	**72,15**
5	HR investment Costs	89,13	65,80	52,30	69,07
6	Facility Investment Costs	88,26	62,01	96,61	82,29
7	Infrastructure Investment Costs	136,40	125,46	111,14	124,33
Total		**313,79**	**253,27**	**260**	**275,70**

Table 11: Available Funds UPME, Source: SAR UNILA

No.	Type of Use	UPPE (In Million Rupiah)			
		2020	2021	2022	Average
1	Educational Operational Costs	168,12	38,98	56,67	87,92
	a. Lecturer Costs (Salary, Honorarium)	521,82	398,61	438,84	460,22
	b. Education Staff Costs (Salary, Honorarium)	146,76	112,11	123,42	146,76
	c. Learning Operational Costs (Consumable Materials and Equipment)	15,13	27,03	23,80	21,99
	d. Indirect Operational Costs (Electricity, Gas, Water, Building Maintenance, Facilities	145,89	120,09	123,03	129,67
	Maintenance, Overtime Pay, Telecommunications, Consumption, Local Transport, Taxes, Insurance, etc.)				
2	Student operational costs (reasoning, interests, talents, and welfare).	35,33	21,32	26,72	27,79
Total		**1033,05**	**606,03**	**230,22**	**874,345**
3	Research Costs	53,68	46,52	52,57	51,70
4	Pkm Costs	19,91	17,55	17,49	20,33
Total		**73,59**	**64,07**	**70,06**	**69,24**
5	HR Investment Costs	71,86	66,61	59,20	67,80
6	Facility Investment Costs	71,15	62,78	109,37	113,50
7	Infrastructure Investment Costs	109,96	127,01	125,82	120,73
Total		**252,97**	**256,4**	**294,39**	**267,92**

Table 12: Available Funds UPME, Source: SAR UNILA

The implementation of the four undergraduate programme is supported by facilities, which include offices, lecture rooms, as well as learning and research laboratories. According to the Self-Assessment Report there are 13 laboratories used for the four undergraduate programmes. These are: Mathematics Learning Laboratory, Biology Learning Laboratory, Physics Learning Laboratory, Chemistry Learning Laboratory, Computer Laboratory, and Microteaching Laboratory. These laboratories are located at the Faculty of Teacher Training and Education. Additional laboratories, which can also be used by teachers and students from FKIP, are available at the Faculty of Sciences and Mathematics. This includes: Zoology Laboratory, Microbiology Laboratory, Analytical Chemistry Laboratory, Organic Chemistry Laboratory, Inorganic Chemistry Laboratory, Physical Chemistry Laboratory, and Biochemistry Laboratory. Other public facilities such as health services, sports grounds, and conference halls are available and managed by the university.

The experts confirm that each floor of the laboratory building is equipped with fire extinguishers and emergency stairs to facilitate the evacuation process if an emergency situation occurs. The laboratories follow standard security procedures. Each laboratory has a lab supervisor; in addition, there are several senior students that work as lab assistants.

FKIP has a micro teaching laboratory, where a group of students can do micro teaching sessions while being observed by other students and teachers. This learning laboratory is

well equipped and suitable for providing learning experiences to prospective teachers under the guidance of lecturers. In addition, there are a well-equipped laboratories for producing podcasts and virtual reality applications.

During the audit, the expert group also visits the laboratories in the Faculty of Teacher Training and Education and the Faculty of Sciences and Mathematics to assess the quality of the facilities and the technical equipment. They notice that there are no severe bottlenecks due to missing equipment and confirm that the laboratories are equipped with the necessary basic equipment. However, most of the instruments and devices are outdated and should be replaced. On the other hand, the technical equipment of the Botany Laboratory was up-to-date. Students worked with modern and powerful microscopes and digitalised their results in an appropriate manner. There is also an immediate need to renovate the laboratories, especially in the Faculty of Sciences and Mathematics. For an adequate teacher training it is necessary to adapt the technical equipment in the laboratories to today's standards. The experiments conducted by the students in the laboratories are aligned with the experiments they will conduct as teachers in secondary schools. However, the students and future teachers should also be familiar with further experiments at a higher level of understanding.

The mathematics laboratories, especially the computer rooms, are quite good. However, software for subjects other than statistics, such as geometry and assessment, is still lacking. Additionally, there is no space available for creating teaching aids that require tools like saws, hammers, and safety equipment.

Besides the facilities at the Faculty of Teacher Training and Education, there is the Integrated Laboratory with modern research equipment for advanced laboratory work. The Integrated Laboratory is used by staff members from all faculties upon appointment. During the audit, the experts learn that experiments in the Bachelor’s programmes are usually done by a group of three to five students; the exact group size depends on the specific class.

One critical point from the experts’ point of view is the fact that not all of the visited laboratories follow international safety standards. The experts point out that the basic personal protective equipment that needs to be available to all persons working in laboratories includes safety goggles, laboratory coats, and hand gloves. It should be worn when working in the laboratory with chemicals and when conducting sensitive experiments. Students should be trained in the right use of the equipment (e.g. the need to change contaminated gloves before touching a door handle or a keyboard, which also might be used by persons not wearing safety gloves). The personal protective equipment should be stored separately from street clothes. In addition, working safety hoods should be available in all labs (with

exhaust to the outside) and chemicals and solvent containers should be labeled properly and be stored in special lockers with exhausts leading outside the labs. Moreover, there should be emergency exit signs and posters with the safety regulations. Safety of physics experiments could be easily enhanced with simple emergency-switches, which would shut down the electric power supply for all sockets. The gas cylinders must not be left unsecured in the laboratory. The experts also noticed that some laboratories were unclean and dusty. To ensure that the labs remain functional and free of contamination, regular cleaning and inspections should be conducted. This would help maintain a ready-to-use environment at all times. Finally, it is important that all students know how sterile work in a laboratory is conducted and that at least once year a safety inspection of the laboratories is done.

The experts stress that there are many hazardous substances and instruments used in the laboratories, which causes a significant risk of accidents and presents a danger to human health, and the natural environment. This demands care in order to protect human health, conserve the natural environment and to prevent laboratory accidents. As a consequence, UNILA needs to draw up a plan, how the internationally accepted safety standards are adopted in all laboratories in the near future.

The students express their satisfaction with the library and the available literature there. Remote access via VPN is possible (there is Digital Library UNILA for this purpose) and UNILA offers access to several scientific digital databases such as ScienceDirect and Taylor & Francis, so that teachers and students have sufficient access to current scientific papers, e-books, and papers.

In summary, the expert group judges the available funds, the technical equipment, and the infrastructure (laboratories, library, seminar rooms etc.) to comply – besides the mentioned restrictions – with the requirements for adequately sustaining the degree programme.

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

The experts appreciate that UNILA will renovate the laboratories, purchase new software, and will make a list of instruments that need to be replaced. The experts expect UNILA to submit a detailed concept and timetable on these issues in the further course of the accreditation procedure.

The experts consider criterion 3 to be mostly fulfilled.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Homepage Ba Biology Education: https://biologi.fkip.unila.ac.id/akademik/
- Homepage Ba Chemistry Education: https://kimia.fkip.unila.ac.id/kurikulum/
- Homepage Ba Mathematics Education: https://math.fkip.unila.ac.id/en/curriculum/
- Homepage Ba Physics Education: https://fisika.fkip.unila.ac.id/kurikulum/
- Homepage UNILA: https://www.unila.ac.id/en/
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The students, as all other stakeholders, have access to the module descriptions via UNILA's homepage.

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

However, the experts need to point out that the literature references in module descriptions are outdated and do not always include all information (e.g. author, title, journal or book). Additionally, the mentioned content does not always match the topics that are actually taught in the respective course and some module descriptions are missing.

For this reason, the experts expect UNILA to update the module descriptions for all four programmes and to provide complete module handbooks that include all module descriptions.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Diploma

- Sample Diploma Supplement

Preliminary assessment and analysis of the experts:
The experts confirm that the students of the four undergraduate programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The experts confirm that the Diploma Supplement is aligned with the European template and includes all necessary information.

The Transcript of Records lists all the courses that the graduate has completed, the achieved credits, grades, and cumulative GPA. It also mentions the awarded ECTS point points for each course.

Criterion 4.3 Relevant rules

Evidence:

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

Preliminary assessment and analysis of the experts:
The experts confirm that the rights and duties of both UNILA and the students are clearly defined and binding. All rules and regulations are published on the university's website and the students receive the course material at the beginning of each semester.

In addition, all relevant information about the degree programme (e.g., module handbook, study plan, profile) is available on the English homepage of the programme.

The experts point out that all four programmes are designed for eight semesters. However, the study plans of UPPE, UPCE, and UPBE only include seven semesters. In addition, the submitted study plan of UPBE is not the one, which is currently used and some courses are missing. In addition, the experts learn during the audit that there is a course on entrepreneurship in the third semester of the UPBE programme, but it is not included in the provided study plan.

For this reason, the experts expect that UNILA updates the study plans to include all courses as they are currently offered and to align the study plans with the official length of the degree programmes (eight semesters).

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

As mentioned before, the experts expect to receive the updated module descriptions in the further course of the accreditation procedure.

The experts consider criterion 4 to be mostly fulfilled.

5. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- UNILA Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The experts discuss the quality management system at UNILA with the programme coordinators. The experts learn that there is an institutional system of quality management aiming at continuously improving the degree programme.

This system relies on internal (SPMI) as well as external (SPME) quality assurance. SPMI encompasses all activities focused on implementing measures for improving the teaching and learning quality at UNILA. SPME focuses on both national and international accreditations. Every degree programme and every Higher Education Institution in Indonesia has to be accredited by the National Accreditation Board of Higher Education / Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT). The Bachelor's degree programme Physics Education has received the highest accreditation status (A) from BAN-PT, while the three other programmes (UPBE, UPCE, and UPME) have only achieved the grade (B) from BAN-PT.

At university level, the implementation of internal quality assurance is coordinated by the Institute for Learning Development and Quality Assurance (LP3M), which has several centers related to internal quality assurance, namely:

1) Center for Quality Assurance (Pusat Penjaminan Mutu) related to the implementation of internal quality audits,

2) Center for Curriculum Development and Management of Independent Learning Independent Campus (MBKM), related to curriculum monitoring and evaluation activities, including internships, and student exchanges,

3) Center for Development of Instructional Activities and Learning Innovations (Pusat Pengembangan Aktivitas Instruksional dan Inovasi Pembelajaran), related to monitoring and evaluating the use of learning strategies, and

4) Center for Development of Online Learning and Distance Education (Pusat Pengembangan Pembelajaran Daring dan Pendidikan Jarak Jauh), related to monitoring and evaluating the use of e-learning and online learning media in improving student learning outcomes.

On the faculty level, the implementation of internal quality assurance is coordinated by the Faculty Quality Assurance Team (TPMF), while at programme level it is carried out by the Study Program Quality Assurance Team (TPMPS).

Quality assurance at the faculty level includes (1) carrying out internal monitoring and evaluation of all study programmes and periodic evaluation of academic staff performance; (2) coordinating the implementation of lecture evaluations based on student perceptions conducted every semester; (3) updating the accreditation data of study programmes at the faculty level; (4) submitting the results of internal monitoring and evaluation of study programmes and staff members to the Dean and the Head of LP3M.

The organisational structure of UNILA is depicted in the following diagram:

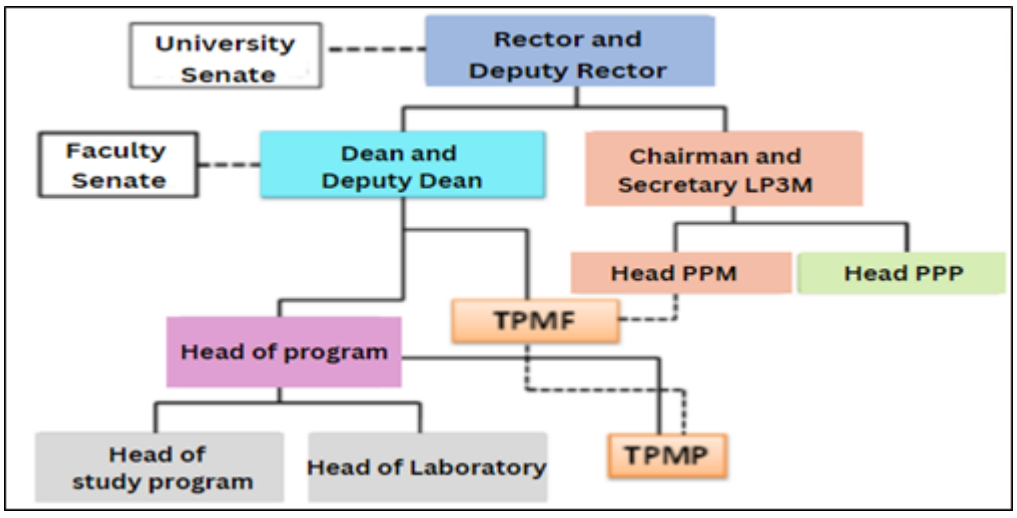

Diagram 1: Organisational Structure UNILA, Source: SAR UNILA

Internal assessment of the quality of the degree programme is mainly provided through student, alumni, and employer surveys. The students give their feedback on the courses by filling out the questionnaire online at the end of each semester. Students assess various

aspects such as students' understanding, lecturer's responsiveness, course delivery, lecturer's proficiency, explanation of course objective, and references in each enrolled course.

Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on the digital platform SIAKADU. The experts point out that there should be a regular and institutionalised survey on students' workload in every course. For example, this could be done by including a respective question in the course questionnaires that students have to fill out at the end of each semester (see Criterion 1.5).

UNILA also regularly (usually once a year) conducts Internal Quality Audits (Audit Mutu Internal, AMI), which are aimed at ensuring that the implementation and management of the study programmes are in line with the university's vision and mission and the Programme Educational Objectives (PEO). During the AMI, every study programme will analyse data on the implementation of educational and research activities, which are documented in the form of reports, monitoring data, and evaluation results. Next, the AMI results will be reported to the TPMF chairman and communicated to the faculty leadership and LP3M. Furthermore, based on the AMI results, the faculty conducted workshops for all study programmes in order to discuss and implement the required measures for improving the study programme.

In addition, UNILA regularly conducts alumni tracer studies and has an alumni association. By taking part at this survey, alumni can comment on their educational experiences at UNILA, the waiting period for employment after graduation, their professional career and can give suggestions how to improve the programme. Furthermore, there is the Career Development Centre at UNILA, which offers help to find suitable internships, announces job vacancies, and offers courses to develop soft skills. UNILA organises a job fair every year, in addition, the contacts students make during the internships sometimes lead to job offers. UNILA also offers a homecoming day for alumni. The Vice-Rector for Student Affairs and Alumni is responsible for this area. However, during the discussion with the employers the experts notice that only a few employers are informed about the opportunity to take part at the job fair. Here, UNILA should be more transparent and regularly inform its partners form the industry, high schools, and other public and private institutions about the existing opportunities.

During the audit, the experts learn that students are not official members of the boards at programme level, but they can make suggestions to the Dean or the Head of Study Programme. Based on the meeting with the Programme Coordinators and the Representative from the Rector's Office, it is apparent that students convey their critiques and suggestions through the Vice Rector for Student Affairs (Vice Rector III), but it would be beneficial to establish a formal student representation body that is directly involved in the decision-

making processes. For this reason, the experts recommend that students' representatives should be members of the boards at UNILA at least on programme or department level and be actively involved in the decision-making processes for further developing the degree programmes.

The experts discuss during the audit if there are regular meetings with the partners on faculty or department level, where they discuss the needs and requirements of the employers and possible changes to the degree programme. They learn that employers and alumni are regularly invited to participate at the programme review workshops to give their feedback on the content of the degree programmes. The experts appreciate that UNILA stays in contact with its alumni and has a close relation with its partners.

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

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

The experts recognise that UNILA takes the feedback from students seriously and that the university will involve student forums to provide suggestions and input for the further development of the study programmes. However, the experts are convinced that it would be even better to make students' representatives members of the boards on programme level at UNILA and to directly involve them in the decision making processes for further developing the degree programmes.

Unfortunately, the provided document (Dean's Decree about Academic Advisory Board) was only submitted in Indonesian, so the experts expect to receive an English translation.

The experts consider criterion 5 to be mostly fulfilled.

D Additional Documents

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

- none

E Comment of the Higher Education Institution (30.10.2024)

UNILA provides the following evidences:

- Decree and Certificate of Accreditation by LAMDIK
- Revised Module Handbook
- Mapping of PLP
- User Satisfaction Survey of UPBE
- Curriculum Workshop
- English Courses for Teachers
- International Activities
- Letter of Commitment for Laboratory Equipment
- Dean's Decree about Academic Advisory Board
- Sample Questionnaires

And the following statement:

> Statements, clarifications and additional information from Universitas Lampung, especially Cluster A, on the Draft Accreditation Report that was sent on 12 October 2024 are written in black colour (the green coloured sections are part of the draft report submitted by ASIIN). The section written in blue with an underline indicates that there is a link to evidence that strengthens the statement from Universitas Lampung.

A. About the Accreditation Process

There are no further comments on this section.

B. About the Accreditation Process

<u>Information</u> in the draft accreditation report:

Name of the degree programme (in original language)	*(Official) English translation of the name*	*Labels applied for*	*Previous accreditation (issuing agency, validity)*	*Involved Technical Committees (TC)*
Pendidikan Kimia	*Undergraduate programme in Chemistry Education*	*ASIIN*	*BAN-PT: B* *2018 - 2023*	*09*

Statement/Clarification from Universitas Lampung:

Name of the degree programme (in original language)	**(Official) English translation of the name**	**Labels applied for**	**Previous accreditation (issuing agency, validity)**	**Involved Technical Committees (TC)**
Pendidikan Kimia	Undergraduate programme in Chemistry Education	ASIIN	LAMDIK: Baik Sekali (Very Good) 2023-2028	09

Notes:

The Undergraduate Programme of Chemistry Education has reaccredited to Lembaga Akreditasi Mandiri Kependidikan (LAMDIK) in 2023, so there is an update of accreditation results from national accreditation agencies.

C. Characteristics of the Degree Programmes

There are no further comments on this section.

D. Expert Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion: 1.3 curriculum

Information in the draft accreditation report:

During the audit the experts learn that also other courses for example "Physics Learning Strategy" require students to go to high schools and observe how teaching is done there. All four undergraduate programmes have similar compulsory courses. The experts appreciate that students are exposed to real teaching in high schools

before they conduct the first teaching internship (PLP 1). However, this should be reflected in the respective module descriptions; this is also required for the exam forms used in these modules.

Statement/Clarification from Universitas Lampung:

The university has conducted a curriculum workshop by inviting all study programs and will be followed up by revising the curriculum at the study program level. At the same time, improvements will be made to the module description and the form of learning evaluation in all courses that equip students for learning practice in schools (PLP). The courses that equip them for the four study programs are as follows:

- UPBE: Teaching and Learning, Management of Education, Biology Learning Strategy, Review Curriculum I, Review Curriculum II, Assessment and Evaluation, Research Methodology, Microteaching.
- UPCE: school chemistry of class X, school chemistry of class XI, school chemistry of class XII, microteaching, chemistry learning design,
- UPME: Capita Selecta of secondary education mathematics, Capita Selecta of high school education mathematics, Mathematics learning strategies, Mathematics learning design, Mathematics learning and education evaluation, Micro teaching,
- UPPE: Physics Learning Strategy, Physics Learning Plans, School Physics, Evaluation of Educational Programme, Microteaching.

Information in the draft accreditation report:

The experts also discuss with the programme coordinators why some students conduct the PLP in elementary schools and not in junior and senior high schools. The programme coordinators explain that there is a high demand for internships from elementary schools and that is why some students conduct the PLP there. If this is done in addition to the compulsory PLP in junior and senior high schools, the experts have no problem with it. Nevertheless, UNILA has to ensure that all students can do their teaching internships in senior or junior high schools and not only in elementary schools. There is a separate degree programme at UNILA for students that want to become teachers at elementary schools and it would be useful if the demand from elementary schools is covered by these students and not by students from programmes that educate teachers for secondary education.

Statement/Clarification from Universitas Lampung

FKIP Unila through the PLT (Integrated Field Practice) unit has facilitated students for teaching internships (PLP 1 and PLP 2) in junior and senior high schools in Lam-

pung Province (school mapping link). The UPBE where students are placed in elementary schools as much as 2.35% is an accommodation of the government program (MBKM) through the Teaching Campus Program 3. Students who PLP in elementary schools (2%) have now graduated, and have worked at Junior and Senior High Schools. then work where it is in junior / senior high school. Based on the results of the tracer study through user satisfaction, the tracer results show that alumni have worked in junior / senior high schools which reflect in accordance with the profile of UPBE graduates.

Information in the draft accreditation report:

However, neither those subjects (like nature of science, international student assessments, conceptual change), nor the application of the Technological Pedagogical Content Knowledge (TPACK) model itself can be found in the modules. For this reason, the experts expect that these topics are implemented in all four study programmes. This can be realized by upgrading the existing modules, and additionally by offering new modules. A module on PCK in science education, for example, focusing on conceptual change and student misconceptions, could be integrated in all four study programmes. The UBCE programme offers the possibility of including PCK in the training modules for School Chemistry of Classes X, XI and XII (KKM620103, KKM620204 and KKM620214), respectively. It would also be feasible to incorporate PCK into the training modules for mathematics and physics teachers.

Statement/Clarification from Universitas Lampung:

TPACK has been implemented for all study programs in microteaching, school physics, school mathematics, school chemistry and curriculum review courses. The RPS includes the form, method, media and learning experience columns, which outline the subject teaching strategies. RPS is a standardized format issued by LP3M. Therefore, in the revision of the module handbook, it will be described more comprehensively (TPACK, SSI and the latest references are inserted in educational support courses) regarding subject teaching strategies in the type of teaching, context hour section. In this case, changes to the module handbook have been planned, Unila has invited a team of experts from the Ministry in the Higher Education Curriculum (KPT) workshop on October 15, 2024 as a first step to revising the curriculum. Follow-up activities at the study program level are in the form of course and module improvements in accordance with the times.

Information in the draft accreditation report:

The curricula of the four programmes are not sufficiently inspired by the international state of the art in science education research. Because of all these observations illustrated by the three examples, the experts' impression during the audition is that

this international state of art has not yet sufficiently informed FKIP, neither the teaching practice at the faculty, nor the staff's research activity. While the staff appears to be very passionate and ambitious about the quality of their teaching, it remains a concern that they do not introduce the students to the global state of the art in this domain.

Statement/Clarification from Universitas Lampung:

In 2025, Unila will implement a new curriculum. The curriculum revision process began with workshop activities which were held on October 15, 2024. Furthermore, the study program invited students, alumni, users, associations and provide input on the existing curriculum in accordance with international updates in the field of mathematics and science education research. Besides that, we will revise the curriculum by referring to the international curriculum, for example to University of Wollongong (Australia), University of Pittsburgh and University of Nottingham (UK) with the link listed below. The study program followed up by making changes to courses and module designs using the conceptual change, NOS, and SSI approaches. The following are details of the planned curriculum revision activities.

No	Form of activity	Implementation
1	Conducting curriculum workshop in Universitas Lampung	October 15, 2024
2	Inviting students, alumni, partners, users, professional associations to evaluate the existing curriculum	November 1-December 30, 2024
3	Curriculum revision at study program level in accordance with curriculum preparation guidelines and input from students, alumni, partners, users, professional associations (link)	January 1 – March 3, 2025
4	Drafting new curriculum	March 3 – April 30, 2025
5	Reviewing Curriculum draft by experts	May 2-30, 2025
6	Legalization of new curriculum through meeting among heads of study programs and faculty	June 1, 2025
7	Socialization of curriculum	June 2 – 30, 2025

Information in the draft accreditation report:

The experts derive this from the reference lists in the modules, which does not contain any cornerstone works of modern science education. Instead, the literature used in the courses, as far as it was visible to us from the documents, is from various other domains such as general pedagogy and educational psychology. While these works are not irrelevant, they cannot reflect the vast body of knowledge that exists about subject-specific learning obstacles and teaching strategies (PCK, see above). The tradition of best practice in the field of science education has been replaced long ago by empirical studies all over the world, so it is not a matter of taste or of personal experience any more how effective science teaching can be realized. The impression from the documents and the meetings is that UNILA doesn't yet meet this worldwide standard unfortunately. The students should be acquainted with the major theories and frameworks in science education research, as well as socio-scientific issues, and they should write their final projects in the light of this state of the art. The experts point out that all four undergraduate programmes under review need to ensure that essential subjects such as molecular biology, bioinformatics, artificial intelligence, big data, and green chemistry are part of the curriculum of the respective degree programme. The courses may be set up as collaborative courses with the Faculty of Mathematics and Natural Sciences. Even if these subjects are not taught to high school students, it is important that teachers are familiar with them, as they play a vital role in understanding natural sciences and current developments in this area

Statement/Clarification from Universitas Lampung:

UPBE: Sosio-scientific-issue in basic biology learning examines social context issues which are studied from a biological scientific perspective, including in efforts to solve the problem. In the Conservation Biology course which raises local conservation issues in Lampung regarding the endemic animals (Sumatran Elephant, Sumatran Rhinoceros and Sumatran Tiger) whose populations are declining in Way Kambas National Park. In the Conservation Biology course, students make an observation to resolve socio-economic conflicts in endemic elephant animals which damage plantations, agriculture and housing. Apart from that, students identify problems and construct problem solutions. Solving the problem of the threat of endemic animal extinction and the factors that cause it both naturally and due to human activity, students create educational media on the importance of preserving animal conservation based on observation data and literature analysis. Natural of Science in education is in principle the nature of knowledge which is a complex concept involving philosophical, sociological and historical knowledge. In the Basic Biology course, in the concept of cells through observing onion roots, the construct of understanding about cells begins through observing real objects to prove hypotheses. Furthermore, students conduct literature studies to strengthen the findings to build concepts.

UPCE: One of the integrations of SSI in Chemistry learning is in the KKM620108 course, Chemistry Learning Based on Local Wisdom and Ethnoscience, and KKM 620321 Development of Green Chemistry Based Experimental Procedures, students are trained to link chemical concepts with social, ethical, and moral issues relevant to everyday life such as Plastic Pollution and Recycling. The issues raised e.g. Plastic polymers that do not biodegrade easily cause environmental pollution problems. In this course, students learn the chemical properties of plastics, polymerization processes, and alternative biodegradable materials. In addition, discussions can be directed towards recycling techniques and reducing the use of plastics in everyday life. In this case, students are trained to think critically and make decisions based on scientific evidence. One of the integrations of Nature of Science (NOS) in learning Chemistry is the basic chemistry course (KKM620101). This course discussed the development of fundamental laws of Chemistry, development of atomic theory (Dalton to Quantum Mechanics theory), development of periodic tables, development of chemical bonding theory. This course equips students how the theory was obtained through empirical evidence. This course also emphasizes that a theory is tentative based on the latest discoveries. Students are equipped with an in-depth understanding of the process of developing scientific concepts and theories, as well as how they are tested, revised, or accepted in the scientific community.

UPME: The 2024 curriculum revision will be implemented in 2025 and is planned to include SSI and NOS as part of the learning outcomes/teaching materials in relevant courses in the Mathematics Education Study Program. For example, in the statistics course, students are directed to analyze some data, data on temperature rise or climate change that occurs. Students learn to make mathematical models that can be used to predict the temperature rise or climate change. As for NOS, it can be integrated into the basics of science courses, while for other courses, especially related to mathematics content, it is more specific to NOM (Nature of Mathematics) which directs students to think abstractly and deductively. We have revised the module that will integrate NOS and SSI at the link below.

UPPE: UPPE is dedicated to improving the quality and clarity of the handbook module details in response to the constructive feedback provided by ASIIN Experts. This commitment is evident in UPPE's ongoing efforts to improve the handbook module descriptions and updating modern literature and PCK content by the specific domain of each course to meet the standards and expectations set by ASIIN. The handbook modules that have been updated include (1) Physics Learning Strategy, (2) Physics Learning Planning, (3) School Physics, (4) Physics Learning Evaluation and (5) Microteaching. UPPE is also trying to improve the handbook module by aligning course content with the development of courses in various European universities such as UNSW Australia, University of Nottingham UK, Южный федеральный университет per semester. This effort is the basis for UPPE to review the curriculum in the future by adjusting the sequence of courses. Furthermore, UPPE plans to conduct

benchmarking to universities in Europe, such as the University of Nottingham and UNSW Australia.

Information in the draft accreditation report:

However, with respect to English proficiency, the experts emphasise that delivering part of the lectures in English is highly encouraged and teachers should be supported to be fluent in communication in the English language.

Statement/Clarification from Universitas Lampung:

On the other hand, the faculty has been done an effort and commitment to improve Teaching Staff and Students' English skills. Here is the description:

No	Program
1	English Day on Friday
2	English Course for staff and students twice a year
3	The dean's advice letter regarding the organization of lectures using English

Information in the draft accreditation report:

The experts appreciate the effort to foster international mobility and support FKIP to further pursue this path. However, the academic mobility is still low and there is room for improvement.

Statement/Clarification from Universitas Lampung:

1. The Faculty has established cooperation with universities abroad (Universiti Teknologi Malaysia, Universitas Inti Malaysia, Universiti Malaysia Sabah, Bicol University, University of Limerick, Santo Tomas University and Saint Mary University) to facilitate the mobility of students and lecturers abroad.
2. Faculty seeks to increase budget to facilitate student mobility abroad

Information in the draft accreditation report:

To attract international students, FKIP should think about regularly conducting international summer schools.

Statement/Clarification from Universitas Lampung:

The Faculty has planned to hold a summer course at the University of Limerick, for 50 overseas participants in 2025. The realization of the FETT plan is to conduct a sharing session on study and research in Ireland by Dr. Angela Farrell on October 15, 2024.

Criterion 1.3

Information in the draft accreditation report:

The experts point out that all four undergraduate programmes under review need to ensure that essential subjects such as molecular biology, bioinformatics, artificial intelligence, big data, and green chemistry are part of the curriculum of the respective degree programme. The courses may be set up as collaborative courses with the Faculty of Mathematics and Natural Sciences. Even if these subjects are not taught to high school students, it is important that teachers are familiar with them, as they play a vital role in understanding natural sciences and current developments in this area.

Statement/Clarification from Universitas Lampung:

UPBE

In preparing the 2025 Biology Education curriculum, it is planned that there will be additional elective courses in the field of Modern Biology (Bioinformatic Analysis and Molecular Genetic)

UPCE

In the curriculum of the Chemistry Education Study Program, there are already courses Development of Green Chemistry-Based Experimental Procedures in 5th semester. This course trains students to find information related to the concept of Green Chemistry from various sources for the development of experimental procedures. Focus on development more environmentally friendly chemical processes and products, including waste reduction, the use of renewable raw materials, and pollution prevention. Green Chemistry Lecture also involves real case studies from industry, understanding the application of this concept in the field and challenges faced. However, this course is still an elective course. In the 2025 curriculum, it will be made a compulsory course. Likewise, Topics related to artificial intelligence and big data will be taught in the compulsory ICT-Based Chemistry Learning course.

UPME

In the UPME curriculum, there are Computer Programming and ICT Literacy courses and Mathematics learning media that have utilized the utilization of technology, big data and Artificial Intelligence. In the future, UPME will add elective courses related to the utilization of technology, big data and Artificial Intelligence in relevant courses such as Digital Classroom Management, Digital-Based Mathematics Learning,

Mathematical Games, and Educational Multimedia and Graphic Design. We attach the revised draft module below.

UPPE

UPPE is dedicated to improving quality especially to add essential courses in this modern era in response to the constructive feedback provided by ASIIN Experts. This commitment is evident in UPPE's continuous efforts to improve the handbook module descriptions, aiming to meet the standards and expectations set by ASIIN. In response to comments from ASIIN experts, at this time, the current curriculum (Curriculum 2020) uses AI as a tool in technology-based courses. Furthermore, in the 2025 curriculum review, courses related to Data Science, AI for Physics Learning, Internet of Thoughts, Mobile Technology and Applications in Physics Learning, Introduction: Nanostructure physics and their applications, Functional programming in physics tasks, and Computer modeling in astrophysics. In the process, this course will collaborate with FMIPA in its teaching. Data Science, AI for Physics Learning, Internet of Thinks, Mobile Technology and Applications in Physics Learning in collaboration with Unila Computer Science. Subject Introduction: Nanostructure physics and their applications, Functional programming in physics tasks, and Computer modeling in astrophysics in collaboration with Pure Physics FMIPA Unila.

Information in the draft accreditation report:

It is also possible for students and teachers to apply to international organizations like the German Academic Exchange Council (DAAD) or British Council for receiving funds for stays abroad. In addition, FKIP should invite more academics from renowned international universities as guest lecturers. Additionally, the teachers would like to have more support from UNILA and FKIP on establishing international contacts and cooperations in the area of teacher education. Moreover, it would also be useful to provide better financial support for teachers who want to attend international conferences or workshops. The experts emphasize that all teachers should be familiar with the state-of-the-art in science education and keep in touch with the respective international community. To this end, it is necessary that they have the opportunity to attend international workshops and conferences on current topics in science education.

Statement/Clarification from Universitas Lampung:

The faculty will strengthen international collaboration and enrich the insights of lecturers and students by holding a workshop themed "*Improving the Competence of Lecturers and Students Through International Collaboration in Mathematics and Natural Sciences Education."* This workshop will involve a number of education attaches, academics, and students who are studying in several countries. In the near future, the Faculty will organize an ICOPE international seminar with guest speaker Prof. Shaaron Ainsworth from the University of Nottingham on October 25, 2024.

In 2025, this workshop will be facilitated by Dr. rer. nat. Roniyus Marjunus, S.Si., M.Si. is one of the lecturers at Lampung University who is currently serving as the Education and Culture Attaché in Berlin, Germany, who will be the leader of the discussion regarding the role of MIPA education in building synergy between Indonesian students abroad and related parties in Indonesia.

In addition, we will work with several contact persons from leading universities to invite relevant experts in the field of Mathematics and Natural Sciences education. The following are the contact persons who will play a role in inviting these experts:

- **Ismi Rakhmawati** from Innsbruck University, Austria, will assist in inviting experts from Austria.
- **Nong Astriana** from New South Wales University, Australia, will assist in inviting experts from Australia.
- **Muhammad Fikri** from Edinburgh University, Scotland, will play a role in inviting experts from the UK.
- **Galuh Catur Wisnu Prabowo** from the University of Nottingham, United Kingdom, will play a role in inviting experts from the UK.

2. Exams: System, Concept and Organization

a. Criterion 2

Information in the draft accreditation report:

The research topic should be relevant to the expertise of the supervisor and co-supervisor and focuses on educational topics. Students can also choose research topics according to their interests.

Statement/Clarification from Universitas Lampung:

Student research topics have gone through title submission. First, the head of study program announced to the student to choose 2 alternative topics for their final project including 5 related articles. After that, the student meets the academic advisor to discuss the topic. If the advisor agrees with the topic, then the student meets the head of the study program by bringing a submission form with 2 alternative titles that have been approved by the academic advisor. Next, the head of the study program discusses with a team of expert lecturers to choose one of the titles and divides the supervisors according to expertise.

Information in the draft accreditation report:

There are only a few oral exams, for example for presenting the final project. With respect to the professional profiles of the four programs, the proportion of oral exams could be increased, particularly when it comes to PCK content and teaching methods.

Statement/Clarification from Universitas Lampung:

There are several courses that are assessed using oral exams, for example microteaching, research essay proposal, research essay result, and research essay. In addition, in each study program there are also courses that provide oral presentation exams. In UPCE, there are school chemistry for class XI, school chemistry for class XII and chemistry learning design. In UPME, there are Mathematics learning strategies, and Mathematics learning design. In UPBE, there are biology learning strategies, review of junior high school biology curriculum, review of senior high school biology curriculum and Microteaching. In UPPE there is English for Professional Purposes.

1. Resources

a. Criterion 3.1 Staff and Development

Information in the draft accreditation report:

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

Statement/Clarification from Universitas Lampung:

The faculty has collaborated with several overseas universities as evidenced by Memorandum of Understanding. The faculty has a commitment to increase the mobility of lecturers abroad to develop their professional and teaching skills which is stated by a letter of commitment and allocation of funds.

No	Programme	2024 (IDR)	2025 (IDR)
1	SEA Teacher	128.134.300	173.907.700
2	Student Mobility/Teaching Internship in International School	160.120.900	101.290.000
3	International Student Competition	94.486.600	93.869.000
4	Teaching Staff Mobility	600.024.700	600.795.000
5	International Collaboration/ Workshop	272.513.800	270.740.000
6	Join Research	400.000.000	500.000.000

7	Summer Courses (50 Foreign Students)	-	125.000.000

b. Criterion 3.2 Funds and Equipment

Information in the draft accreditation report:

However, most of the instruments and devices are outdated and should be replaced. There is also an immediate need to renovate the laboratories, especially in the Faculty of Sciences and Mathematics. For adequate teacher training it is necessary to adapt the technical equipment in the laboratories to today's standards. The experiments conducted by the students in the laboratories are aligned with the experiments they will conduct as teachers in secondary schools. However, the students and future teachers should also be familiar with further experiments at a higher level of understanding.

Statement/Clarification from Universitas Lampung:

Unila will renovate the laboratory to make it more adequate, especially in the laboratory especially in the Faculty of Sciences and Mathematics. In addition, the study program will propose the procurement of laboratory instruments and devices that need to be replaced.

Besides the facilities at the Faculty of Teacher Training and Education, there is the Integrated Laboratory with modern research equipment for advanced laboratory work. The Integrated Laboratory is used by staff members from all faculties upon appointment.

In the UPBE, The biology learning laboratory provides laboratory equipment facilities such as a binocular microscope and a trinocular microscope (23 units) which are equipped with an optical zoom camera, biological modeling (genetic buttons, photosynthesis, respiration), experimental equipment (reaction tubes, measuring cups, sterilization equipment, and laminar flow), media and the materials in the biology learning practicum have been completed. In the future, the utilization and use of modern technology in student practices such as data analysis software (insilico), PCR, and other sophisticated laboratory equipment is planned to carry out resource sharing with the MIPA faculty.

In the UPCE, the chemistry learning laboratory has modern equipment for practicum and occupational safety, namely a new fume hood, digital pH meter, UV-Vis spectrophotometry, digital scale, hot plate, and oven. All of these tools greatly support practicum for modern chemistry education students.

In the UPME, laboratory experience for practicum courses that use software such as statistics, learning media, numerical methods, learning evaluation has been facilitated by a computer laboratory equipped with 50 computers with several software that support practicum implementation. However, to improve the effectiveness of learning in the future, we plan to optimize the use of existing equipment by completing and updating software that can support the implementation of practicum so that students can gain practical experience with more up-to-date software. In addition, to facilitate students to make learning media that are not technology-based, UPME will also provide a special room for learning media production such as for example making props that require tools such as saws, hammers, and safety equipment.

In the UPPE, laboratory experiences for pure physics courses have been implemented, covering most practical materials in accordance with the curriculum. However, to enhance the effectiveness of learning in the future, we plan to optimize the use of existing equipment. One important step in this development is the introduction of new tools, namely the mass spectrometer, which is expected to provide a deeper practical experience for students. The mass spectrometer will be used in several laboratory practices, including in the Optics course, which focuses on understanding the properties of light and its interactions with matter; Atomic Nucleus, which discusses the structure and behavior of atomic nuclei; and Radioactivity, which studies the properties and measurements of radiation.

In addition, all of these practical activities will be included in the revision of the Module Handbook, where we will enhance the course descriptions and the learning outcomes related to the practical components. This revision aims to ensure that students not only understand the theory behind physics concepts but also can apply them in practical contexts. Thus, we hope that the integration of these practical experiences will enhance students' practical skills, reinforce their conceptual understanding, and prepare them for real-world challenges in the fields of education and physics research.

Information in the draft accreditation report:

One critical point from the experts' point of view is the fact that not all of the visited laboratories follow international safety standards. The experts point out that the basic personal protective equipment that needs to be available to all persons working in laboratories includes safety goggles, laboratory coats, and hand gloves. It should be worn when working in the laboratory with chemicals and when conducting sensitive experiments. Students should be trained in the right use of the equipment (e.g. the need to change contaminated gloves before touching a door handle or a keyboard, which also might be used by persons not wearing safety gloves). The personal protective equipment should be stored separately from street clothes.

Statement/Clarification from Universitas Lampung:

In chemistry, learning laboratory will improve the basic personal protective equipment that needs to be available to all persons working in laboratories including safety goggles, laboratory coats, and hand gloves.

The faculty will budget for laboratory settings and supporting equipment for practicum worth 266.824.000 IDR in 2025.

Information in the draft accreditation report:

The mathematics laboratories, especially the computer rooms, are quite good. However, software for subjects other than statistics, such as geometry and assessment, is still lacking.

Statement/Clarification from Universitas Lampung:

The faculty will facilitate the procurement of software licensed in 2025 in geometry courses, learning evaluation, numerical methods, learning media. In addition, UPME will also share resources with the computer laboratory of the Faculty of Mathematics and Natural Sciences whose software is more complete.

In November 2024, the faculty budgets for the procurement of licensed software for computer laboratories to facilitate practicum at UPME worth 75.000.000 IDR. Besides, The Faculty will facilitate the procurement of software licensed.

Information in the draft accreditation report:

Additionally for the mathematics laboratories, there is no space available for creating teaching aids that require tools like saws, hammers, and safety equipment.

Statement/Clarification from Universitas Lampung:

The faculty will facilitate UPME Laboratory a special room for creating teaching aids that require tools such as saws, hammers, and safety equipment even though in the future it does not really need a room for teaching aids with heavy equipment, because in the future it will be replaced by IT-based media. The Faculty of Teacher Training and Education currently has a virtual room that can be used by students to develop IT-based teaching aids.

The faculty will budget for laboratory settings and supporting equipment for practicum worth 266.824.000 IDR in 2025. One of them is to equip tools and materials in a special room for creating teaching aids (Workshop for making learning media) for

the Mathematics Education laboratory. Here we attach financial planning in the Unila planning management information system. Besides, The Faculty will facilitate the procurement of equipment required.

Figure 5. Figure of Computer Laboratory & Virtual Room (UPME)

4. Transparency and Documentation

a. Criterion 4.1. Module Description

Information in the draft accreditation report:

However, the experts need to point out that the literature references in module descriptions are outdated and do not always include all information (e.g. author, title, journal or book). Additionally, the mentioned content does not always match the topics that are actually taught in the respective course and some module descriptions are missing. For this reason, the experts expect UNILA to update the module descriptions for all four programmes and to provide complete module handbooks that include all module descriptions.

Statement/Clarification from Universitas Lampung:

In 2025, Unila will revise the curriculum, update module descriptions, update literature references and provide module handbooks. At the same time, our four study programs will make improvements to the curriculum.

Faculty Budget Plan 2025 for curriculum revision activities for all study programs as much as 27.375.400 IDR.

b. Criterion 4.3. Relevan Rules

Information in the draft accreditation report:

The experts point out that all four programmes are designed for eight semesters. However, the study plans of UPPE, UPCE, and UPBE only include seven semesters. In addition, the submitted study plan of UPBE is not the one, which is currently used and some courses are missing. In addition, the experts learn during the audit that there is a course on entrepreneurship in the third semester of the UPBE programme, but it is not included in the provided study plan. For this reason, the experts expect that UNILA updates the study plans to include all courses as they are currently offered and to align the study plans with the official length of the degree programmes (eight semesters).

Statement/Clarification from Universitas Lampung:

UPPE and UPCE will conduct a curriculum revision in 2025 to facilitate the study plan from 7 semesters to 8 semesters. UPPE received a statement from the expert, previously UPPE explained that the curriculum design was up to 7 semesters to increase

student on-time graduation. Given that the KTW of previous students was small, but after this implementation, UPPE's KTW increased to 66% (ranked 5th in unila), students in the class of 2020 graduated on time (≤ 4 years), but basically in the 8th semester it does not mean that students cannot take courses, but students can take thesis or elective courses.

UPPE and UPCE considers input from experts to develop curriculum structures up to 8 semesters. So that in the next curriculum review will be prepared with a curriculum structure of 8 semesters. As for UPBE and UPME, in the curriculum document, the courses have been distributed in 8 semesters.

Faculty Budget Plan 2025 for curriculum revision activities for all study programs as much as 27.375.400 IDR.

Criterion 5. Quality management: quality assessment and development

Information in the draft accreditation report:

However, during the discussion with the employers the experts notice that only a few employers are informed about the opportunity to take part at the job fair. Here, UNILA should be more transparent and regularly inform its partners from the industry, high schools, and other public and private institutions about the existing opportunities.

Statement/Clarification from Universitas Lampung:

Unila already has an Integrated Service Unit for career development and entrepreneurship that is tasked with sharing job vacancy information that can be accessed by the public. Here are the details of the activities for job careers for students organized by CCED Unila (Career and Entrepreneurship Development).

No	Activity	Implementation
1	FGD Barriers to Student Career Preparation	11-14 July 2023
2	Training and Student Competency Testing	30 October s.d. November 3, 2023
3	Peer Career Consultation Training	February 14 – March 1, 2023
4	Preparatory Training for Entering the World of Work	8 - 11 August 2023
5	Student Career Seminar	8 – 10 March 2023
6	Visual Presentation Design Skills Workshop	7 – 8 November 2023
7	Workshop on Building Personal Branding	24 -25 October 2023
8	Workshop on Preparing a Digital CV	7 – 8 November 2023
9	Workshop Public Speaking	15 -16 November 2023
10	Workshop Social Media Branding	26 -27 October 2023
11	COVER Academic Professional Insight Workshop	11 – 14 July 2023
12	Workshop on Insight into the Academic Professional Field	19 – 21 October 2023
13	Practitioner Professional Field Insight Workshop	4 – 5 October 2023

Information in the draft accreditation report:

For this reason, the experts recommend that students' representatives should be members of the boards at UNILA at least on programme or department level and be actively involved in the decision-making processes for further developing the degree programmes.

Statement/Clarification from Universitas Lampung:

In accordance with the existing regulations in Indonesia, there are 3 clusters, namely PTNBH (PT Negeri Berbadan Hukum), BLU (Public Service Agency), Satker (Work Unit). Only the PTNBH cluster has authority over student involvement (Regulation-Pasal 30) as a trustee assembly in decision-making. The Board of Trustees (MWA) is the highest institution in Legal Entity State Universities (PTN-BH) that represents the interests of the government, society, and universities. MWA has the following functions: Determination, Consideration of the implementation of general policies,

Supervision in the academic and non-academic fields. The organizational structure of MWA consists of: Minister (Education), University Academic Senate, Rector, Community, Employees, Students. The Minister appoints and dismisses MWA members for a term of five years, except for students whose position is only one year. At this time, Unila is in the BLU cluster so students do not have the authority to be involved in decision-making.

At the study program level, there is a student forum, but it has not been involved in decision making. In the future, study programs will be committed to involving student forums to provide suggestions and input for the development of study programs. Study programs have involved student representatives in decision making through student forums in each study program. The authority of students in decision-making is stated in the Dean's decree.

The involvement of students at the study program level in decision making, for example decisions related to the learning process, has been facilitated using the course feedback questionnaire filled out by students through SIAKADU in all study programs that serves as the basis for discussing improvements in the implementation of courses in the following semester. This process will be reinforced by the Dean's Decree that mandates lecturers to improve the course processes in accordance with student feedback. This step is taken as part of the quality assurance efforts in education.

Information in the draft accreditation report:

Since the workload of the students was only estimated by the programme coordinators and seems to be too low in comparison to the actual time needed by the students, the experts ask UNILA to verify the students' total workload and to adjust the awarded ECTS points. This could e.g. be done by including a respective question in the satisfaction questionnaires. In any case, UNILA must make sure that the actual workload of the students and the awarded ECTS credits correspond with each other and make that information transparent in the module descriptions and the study plans.

The experts point out that there should be a regular and institutionalised survey on students' workload in every course. For example, this could be done by including a respective question in the course questionnaires that students have to fill out at the end of each semester.

Statement/Clarification from Universitas Lampung:

All study programs have made a questionnaire to see the suitability of the workload of a course with the actual time. The questionnaire is available on each study program website and has been filled in by students. The results of the questionnaire analysis show that the workload of each course in all study programs is appropriate.

F Summary: Expert recommendations (11.11.2024)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology Education	With requirements for one year	-	30.09.2030
Ba Chemistry Education	With requirements for one year	-	30.09.2030
Ba Mathematics Education	With requirements for one year	-	30.09.2030
Ba Physics Education	With requirements for one year	-	30.09.2030

Requirements

For all degree programmes

A 1. (ASIIN 1.3) Teach students about essential science subjects in their respective field.

A 2. (ASIIN 1.3) Use current scientific literature in all courses.

A 3. (ASIIN 1.3) Students should do their teaching internships in senior or junior high schools and not only in elementary schools.

A 4. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 5. (ASIIN 3.2) Submit a concept and a timetable on how to update the instruments and how to renovate the laboratories within the accreditation period.

A 6. (ASIIN3.2) Strictly follow international standards on safety regulations in all laboratories.

A 7. (ASIIN 4.1) Update the module descriptions in order to reflect correctly the actually taught content.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to teach all students pedagogical content knowledge (PCK, subject-specific didactics) and to make them familiar with the underlying theoretical concepts. The PCK contents should be aligned with the international state of the art in science education and science education research.

E 2. (ASIIN 3.1) It is recommended to better support teachers with respect to writing scientific publications and submitting them to renowned journals in order to help them to reach the next academic level and become full professors in the end.

E 3. (ASIIN 3.1) It is recommended to improve the teachers' English proficiency.

E 4. (ASIIN 3.1) It is recommended to provide better financial support for teachers who want to attend international conferences or workshops.

E 5. (ASIIN 5) It is recommended to make students' representatives members of the boards on programme level at UNILA and to directly involve them in the decision making processes for further developing the degree programme.

For Ba Biology Education

E 6. (ASIIN 1.3) It is recommended to offer a practicum in Marine Biology.

G Comment of the Technical Committees (22.11.2024)

Technical Committee 09 – Chemistry, Pharmacy (18.11.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the requirements and recommendations proposed by the expert group. This concerns the curricula, the school internships, the scientific literature used, the improvement of laboratory equipment, compliance with international safety standards in the laboratories, the module descriptions, and the review of the students' workload. The Technical Committee discusses the procedure and proposes changes to the wording of requirements A3 and recommendations E1 and E6. Overall, it agrees with the proposed requirements and recommendations.

The Technical Committee 09 – Chemistry, Pharmacy recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Chemistry Education	With requirements for one year	-	30.09.2030

Technical Committee 10 – Life Sciences (22.11.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the requirements and recommendations proposed by the expert group. This concerns the curricula, the school internships, the scientific literature used, the improvement of laboratory equipment, compliance with international safety standards in the laboratories, the module descriptions, and the review of students' workload. The Technical Committee proposes an addition to condition A7, as the wording of the learning objectives in the module descriptions is also in need of improvement. Otherwise, the TC agrees with the proposed requirements and recommendations.

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology Education	With requirements for one year	-	30.09.2030

Technical Committee 12 – Mathematics (21.11.2024)

Assessment and analysis for the award of the ASIIN seal:

The TC members discuss the requirements, in particular A 5 and A 6, which are not primarily relevant to mathematics, and A 1, A 4 and A 7, which are of a fundamental nature. In addition, the members note a contradiction, as on the one hand the translation of a document is noted, but on the other hand, the completeness of the documents is mentioned. Furthermore, a typographical error (duplication of ‘should be’) is noted in E 1. Otherwise, the TC agrees with the experts' assessment without any changes.

The Technical Committee 12 – Mathematics recommends the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Mathematics Education	With requirements for one year	-	30.09.2030

Technical Committee 13 – Physics (21.11.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows the assessment of the experts with some wording changes in A1, E1 and E2. Concerning A1, the TC found the term "modern topics" to be more precise than "essential scientific topics", as the report dealt with topics such as big data and the like. In addition, the TC is the opinion that the explanation at the end of E1 is not necessary, as the support of teachers with respect to writing scientific publications is not solely contingent on becoming full professors. Rather, it is a broader aspect of their work within a specific field and in research activities.

The Technical Committee 13 – Physics recommends the award of the seals as follows:

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditation**
Ba Physics Education	With requirements for one year	-	30.09.2030

H Decision of the Accreditation Commission (06.12.2024)

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

The Accreditation commission discusses the procedure and agrees with the changes as suggested by the different TC's.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Biology Education	With requirements for one year	-	30.09.2030
Ba Chemistry Education	With requirements for one year	-	30.09.2030
Ba Mathematics Education	With requirements for one year	-	30.09.2030
Ba Physics Education	With requirements for one year	-	30.09.2030

Requirements

For all degree programmes

A 1. (ASIIN 1.3) Teach students about modern topics in their respective field.

A 2. (ASIIN 1.3) Use current scientific literature in all courses.

A 3. (ASIIN 1.3) Make sure that students do their teaching internships in senior or junior high schools and not only in elementary schools.

A 4. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly.

A 5. (ASIIN 3.2) Submit a concept and a timetable on how to update the instruments and how to renovate the laboratories within the accreditation period.

A 6. (ASIIN3.2) Strictly follow international standards on safety regulations in all laboratories.

A 7. (ASIIN 4.1) Update the module descriptions in order to reflect correctly the actually taught content and reword the intended learning outcomes (e.g. by using Blooms taxonomy).

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to teach all students pedagogical content knowledge (PCK) and to make them familiar with the underlying theoretical concepts. The PCK contents should be aligned with the international state of the art in science education and science education research.

E 2. (ASIIN 3.1) It is recommended to better support teachers with respect to writing scientific publications and submitting them to renowned journals.

E 3. (ASIIN 3.1) It is recommended to improve the teachers' English proficiency.

E 4. (ASIIN 3.1) It is recommended to provide better financial support for teachers who want to attend international conferences or workshops.

E 5. (ASIIN 5) It is recommended to make students' representatives members of the boards on programme level at UNILA and to directly involve them in the decision making processes for further developing the degree programme.

For Ba Biology Education

E 6. (ASIIN 1.3) It is recommended to offer a practical course in Marine Biology.

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **Programme Education Objectives (PEO)** shall be achieved by the Bachelor's degree programme Biology Education:

UPBE	1.	Developing graduates able to master knowledge/skills in the field of pedagogy and biology concepts to perform their professional or entrepreneur tasks
	2.	Having graduates able to do research, learning innovations for developing professional skills to solve education problems
	3.	Having a strong and good personality of graduates able to compete globally

The following Programme Learning Outcomes (PLO) are presented:

Competency SSC-ASIIN	Aspect	PLO	Description
Specialist Competences	Knowledge	PLO1	Mastering the concepts of education in general and science deeply (work skills and laboratory management)
		PLO2	Mastering the biology concept with comprehensive
		PLO3	Mastering principles of TPACK (Pedagogy, Technology, and Content Knowledge) in biology learning
	Special Skills	PLO4	Can design, implement, and evaluate biology learning that develops higher order thinking skills and character of students.
		PLO5	Able to observe and solve problems of science education and learning, especially biology
		PLO6	Have an entrepreneurial spirit based on sustainable development (sustainable resources).
Social Competences	General Skills	PLO7	Able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that pays attention to and applies humanities values in accordance with their field of expertise;
		PLO8	Able to compile a scientific description of the results of the studies mentioned above in the form of a thesis or final project report, and upload it on the university's website;
		PLO9	Able to maintain and develop a network with supervisors and colleagues, both inside and outside the institution;
		PLO10	Able to document, store, secure, and retrieve data to ensure validity and prevent plagiarism.
	Attitude	PLO11	Fear of God Almighty and able to show a religious attitude by appreciate the diversity of cultures, views, religions, and beliefs, as well as the opinions or original findings of others

Competency SSC-ASIIN	Aspect	PLO	Description
		PLO12	Internalize the spirit of collaboration, struggle, and entrepreneurship.

The following **curriculum** is presented:

NO	CODE	COURSE TITLE	CU	ECTS
		Semester-1		
1	UNI616101 -616105	Religion Education	3 (2-1)	4.8
2	UNI617108	Pancasila	2 (2-0)	3.2
3	KIP620101	Basic Education	2 (2-0)	3.2
4	KIP620103	Scouting	1 (0-1)	1.6
5	KIE619101	Basic Mathematics	2 (2-0)	3.2
7	KIE619102	Basic Physics	2 (2-0)	3.2
8	KIE619103	Basic Chemistry	2 (2-0)	3.2
9	KBO620101	Basic Biology	3 (2-1)	4.8
10	KBO620102	Environmental Knowledge	2 (2-0)	3.2
		Semester-2		
1	UNI616106	Indonesian Language Education	2(2-0)	3.2
2	UNI616107	Citizenship Education	2(2-0)	3.2
3	KIP620104	Teaching and Learning	2(2-0)	3.2
4	KIP620102	Psychology Education	3(3-0)	4.8
5	KIP619104	ICT-Based Learning	3(1-2)	4.8
6	KBO620103	Biochemistry	2(2-0)	3.2
7	KBO620104	Biology Cell	2(2-0)	3.2
8	KBO620105	Plant Structure and Development	3(2-1)	4.8
9	KBO620201	Management of Laboratory	3(1-2)	4.8

		Semester- 3		
1	KIP620201	Management of Education	2(2-0)	3.2
2	KBO620202	Invertebrate Zoology	3(2-1)	4.8
3	KBO620203	Animal Structure	3(2-1)	4.8
4	KBO620204	Genetics	3(2-1)	4.8
5	KBO620205	Evolution Theory	2(2-0)	3.2
6	KBO620206	Biology Learning Strategy	3(2-1)	4.8
7	KBO620208	Botanic I	3(2-1)	4.8
8	KBO620214	Production and Utilization of Biology Learning Media	3(1-2)	4.8
		Semester-4		
1	KBO620207	Vertebrate Zoology	3(2-1)	4.8
2	KBO620209	Animal Physiology	3(2-1)	4.8
3	KBO620210	Biodiversity	2(2-0)	3.2
4	KBO620211	Nutrition and Health	2(2-0)	3.2
5	KBO620212	Plant Physiology	3(2-1)	4.8
6	KBO620213	Integrated Science	2(2-0)	3.2
7	KBO620302	Review Curriculum I	3(3-0)	4.8
8	KBO620306	Plant Ecology	3(2-1)	4.8

		Semester-5		
1	KBO620301	Biology Learning Design	3(2-1)	4.8
2	KBO620302	Review Curriculum II	3(3-0)	4.8
3	KBO620303	Assessment and Evaluation	3(2-1)	4.8
4	KBO620304	Animal Development	3(2-1)	4.8
5	KBO620305	Microbiology	3(2-1)	4.8
6	KBO620312	Animal Ecology	3(2-1)	4.8
7	KBO620307	Botanic II	3(2-1)	4.8
8		Elective Course A, B, C	2(2-0)	3.2
		Semester-6		
1	KBO620308	Human Physiology Anatomy	3(3-0)	4.8
2	KBO620310	Research Methodology	3(3-0)	4.8
3	KBO620311	Biotechnology	3(2-1)	4.8
4	KBO620314	Microteaching	3(1-2)	4.8
5	KBO620315	English Professional	3 (2-1)	4.8
6		Elective Course A, B, C	2(2-0)	3.2
		Semester-7		
1	KIP619401	Teaching Internship I	1(1-0)	1.6
2	KIP619402	Teaching Internship 2	3(0-3)	4.8
3	UNI617401	Community Service	3(0-3)	4.8
4	KBO620402	Seminar I	1(0-1)	1.6
5	KBO620403	Seminar II	1(0-1)	1.6
6	KBO620404	Thesis	4(0-4)	6.4

Electives:

		Elective A: Ethnobiology		
1	KBO620408	Toxicology	2(2-0)	3.2
2	KBO620409	Animal Behaviour	2(2-0)	3.2
3	KBO620410	Ethnoscience	2(2-0)	3.2
4	KBO620401	Marine Biology	2(2-0)	3.2
5	KBO620422	Entomology	2(2-0)	3.2
5	KBO620421	Field Trip	1(1-0)	1.6
		Elective B: Applied Biology		
1	KBO620413	Biometrics	2(2-0)	3.2
2	KBO620411	Plant Tissue Culture	2(2-0)	3.2
3	KBO620405	Biology Medicinal Plants	2(2-0)	3.2
4	KBO620421	Field Trip	1(1-0)	1.6
		Elective C: Environment Biology		
1	KBO620416	Waste Treatment Technology	2(2-0)	3.2
2	KBO620417	Conservation	2(2-0)	3.2
3	KBO620418	Epidemiology	2(2-0)	3.2
4	KBO620419	Environmental Health	2(2-0)	3.2
5	KBO620420	Disaster Mitigation	2(2-0)	3.2
6	KBO620421	Field Trip	1(1-0)	1.6

According to the Self-Assessment Report, the following **Programme Education Objectives (PEO)** shall be achieved by the Bachelor's degree programme Chemistry Education:

UPCE	1. Developing graduates able to chemistry and high-order thinking skills
	2. Developing graduates able to chemistry teaching based on everyday life phenomena in secondary schools according to science and technology developments
	3. Developing graduates able to entrepreneurship based on chemical processes and innovative chemistry learning media
	4. Developing graduates able to conduct chemical education research according to science and technology developments

The following Programme Learning Outcomes (PLO) are presented:

Competency SSC-ASIIN	Aspect	PLO	Description
Specialist Competences	Knowledge	PLO1	Mastering the theoretical knowledge of the core subject of chemistry including inorganic, organic and physical chemistry as well as of analytical chemistry; mastering knowledge about students, learning theory and methodology, principles, procedures and evaluation utilization.
		PLO2	Mastering the scientific method and knowledge of software to analyze and develop strategies for solving chemistry education problems; and to develop adaptive and innovative learning media.
		PLO3	Mastering the knowledge of product chemical processes, home industry, product management and marketing system.
	Special Skills	PLO4	Applying the basic concepts of science and mathematics in solving problems based on everyday life phenomena and can be applied in industry
		PLO5	Analyze the relationship between material structure and dynamic properties, reactivity, energy and function in various chemical changes.
		PLO6	Select and apply appropriate separation and measurement methods qualitatively and quantitatively; to solve the problem; and analyzing the relationship between ecosystem principles and environmental ethics with chemistry
		PLO7	Researching and compiling scientific papers based on analysis of information and research data and communicating

Competency SSC-ASIIN	Aspect	PLO	Description
			them in an accurate, accountable, effective and communicative manner.
		PLO8	Designing chemistry lessons according to the competencies to be achieved, based everyday life phenomena, based on material characteristics, student characteristics and existing carrying capacity; with a constructive methodology based on science process skills, applying it, creating adaptive and innovative chemistry learning media, and conducting creative assessments in micro class and school.
Social Competences	General Skills	PLO9	Able to apply logical, critical, systematic, innovative thinking and examine the results of the development or implementation of science and technology to make decisions and solve problems in their field of expertise, based on the results of information and data analysis, application of humanities values based on scientific principles, procedures and ethics.
		PLO10	Able to maintain and develop a network with supervisors, colleagues, experts in producing valid and plagiarism-free thesis.
	Attitude	PLO11	Applying religious values, good morals and ethics, nationalism, humanism, multicultural, and law enforcement in life and completing tasks; as citizens based on Pancasila and have social sensitivity
		PLO12	Able to take responsibility for work in the field of expertise and entrepreneurship by applying academic values, norms and ethics.

The following curriculum is presented:

No	COURSE			ECTS
	CODE	NAME	CU	
		1st semester		
1	UNI620101	Islamic Religious Education*	3	4.8
2	UNI620102	Catholic Religious Education *	3	4.8
3	UNI620103	Christian religious education *	3	4.8
4	UNI620104	Hindu religious education *	3	4.8
5	UNI620105	Budha religious education *	3	4.8
6	UNI620108	Pancasila Education	2	3.2
7	KIP620101	Basic of Education	2	3.2
8	KIE620101	Basic of Math	2	3.2
9	KKM620101	Basic of Chemistry	4	6.4
10	KKM620105	Basic of Biology	3	4.8
11	KIE620104	Basic of Physics	3	4.8
12	KKM620106	History of Chemistry	2	3.2
	Total CU/ECTS		21	33.6

		2nd semester		
1	UNI 620106	Indonesian Language Education	2	3.2
2	UNI 620107	Civic Education	2	3.2
3	KIP 620102	Educational Psychology	2	3.2
4	KKM620103	School Chemistry of Class X	3	4.8
5	KKM620104	Solution Chemistry	4	6.4
6	KKM620107	English for Chemistry	2	3.2
7	KKM620108	Chemistry Learning Based on Local Wisdom and Ethnoscience	2	3.2
8	KIP 620104	Learning Theory	2	3.2
	Total CU/ECTS		19	30.4
		3rd Semester		
1	KIP620201	Education Management	2	3.2
2	KKM620202	Chemical Thermodynamics	4	6.4
3	KKM620203	Alkane and Their Derivatives	4	6.4
4	KKM620204	School Chemistry of Class XI	3	4.8
5	KIE620201	Statistics	3	4.8
6	KKM 620201	Basic Principles of Anorganic Chemistry	3	4.8
7	UNI 620201	Entrepreneurship	3	4.8
8	KKM620205	English for Special Purposes	2	3.2
	Total CU/ECTS		23	36,8

		4th Semester		
1	KKM620215	Aromatics Compounds & Macromolecules	4	6.4
2	KKM620214	School Chemistry of Class XII	3	4.8
3	KKM620209	Qualitative & Quantitative Analitical Chemistry	4	6.4
4	KKM620210	Chemistry Learning Assessment	3	4.8
5	KKM620211	Elemental Chemistry	3	4.8
6	KKM620212	Chemical Kinetics	4	6.4
7	KKM620213	ICT-Based Chemistry Learning	3	4.8
	Total CU/ECTS		23	36,8
		5th Semester		
1	KKM620301	Analytical Separation Chemistry	4	6.4
2	KKM620302	Complex Compound	2	3.2
3	KKM620303	Structure & Function of Biomolecules	3	4.8
4	KKM620304	Chemistry Learning Design	3	4.8
5	KKM620307	Quantum Chemistry	2	3.2
6	KKM620308	Organic Reaction Mechanism	2	3.2
7	KKM620306	School Chemistry Laboratory Management	2	3.2
8	KKM620305	Media Production & Utilization	3	4.8

9	KKM620405	Food Chemistry**	2	3.2
10	KKM620329	Geochemistry**	2	3.2
11	KKM620312	Medical Chemistry**	2	3.2
12	KKM620321	Development of Green Chemistry-Based Experimental Procedures**	2	3.2
13	KKM620216	Element Chemistry Practicum	1	1.6
	Total CU/ECTS		24	38.4
		6th Semester		
1	KKM620313	Chemical Bond	2	3.2
2	KKM620316	Chemical Processes in Metabolism and Genes	2	3.2
3	KKM620315	Educational Research Methodology	3	4.8
4	KKM620314	Microteaching	3	4.8
5	KKM620328	Chemical Instruments	3	4.8
6	KKM619321	Enchantment of Chemistry**	2	3.2
7	KKM619322	Polymer Chemistry**	2	3.2
8	KKM619320	Radiochemistry**	2	3.2
9	KKM619318	Chemical Industry**	2	3.2
10	KKM620319	Computational Chemistry**	2	3.2
11	KKM620322	Field Work Courses**	1	1.6
	Total CU/ECTS		21	33.6

		7th Semester		
1	KIP620401	Teaching Internship 1	1	1.6
2	KIP620402	Teaching Internship 2	3	4.8
3	UNI 620401	Community Service Program	3	4.8
4	KKM620401	Bachelor Thesis Proposal Seminar	1	1.6
5	KKM620402	Research Results Seminar	1	1.6
6	KKM620403	Bachelor Thesis	4	6.4
	Total CU/ECTS		13	20.8

Electives:

No	Code	Courses	CU	ECTS
1	KKM620405	Food Chemistry	2	3.2
2	KKM620329	Geochemistry	2	3.2
3	KKM620312	Medical Chemistry	2	3.2
4	KKM620321	Development of Green Chemistry-Based Experimental Procedures	2	3.2
5	KKM619321	Enchantment of Chemistry	2	3.2
6	KKM619322	Polymer Chemistry	2	3.2
7	KKM619320	Radiochemistry	2	3.2
8	KKM619318	Chemical Industry	2	3.2
9	KKM620319	Computational Chemistry	2	3.2
10	KKM620322	Field Work Courses	1	1.6
Total CU/ECTS			19	30.4

According to the Self-Assessment Report, the following **Programme Education Objectives (PEO)** shall be achieved by the Bachelor's degree programme Mathematics Education:

UPME	1. Developing graduates able to master knowledge and technology/ in the field of mathematics and mathematics education and have a social, professional, inspirational and highly competitive attitude at national and international levels.
	2. Developing graduates able to create businesses in the field of mathematics education, create learning products and market goods or services in the field of education.
	3. Developing graduates able to improve the quality of mathematics learning through research activities in the field of mathematics education

The following Programme Learning Outcomes (PLO) are presented:

	Code	PLO
Knowledge	PLO1	Mastering the concepts and applications of number theory, geometry, algebra, calculus, statistics and probability, applied mathematics that support the mastery of other mathematical concepts, learning mathematics in primary and secondary education, as well as for further studies.
	PLO2	Mastering mathematical pedagogical-didactic concepts to plan, implement and learn mathematics by utilizing information and communication technology (ICT) for mathematics learning in primary and secondary education
	PLO3	Mastering the concept of research methodology as an alternative to solving problems in mathematics education.
	PLO4	Mastering the principles of entrepreneurship and management as well as public communication skills (education entrepreneur).
Special Skill	PLO5	Able to explore, describe, generalize, find misconceptions and reconstruct mathematical facts/concepts/procedures/principles through problem solving by integrating various mathematical abilities
	PLO6	Planning, implementing, and evaluating learning mathematics by applying pedagogic-didactic concepts and mathematics as well as utilizing various learning resources and science and technology aimed at life.
	PLO7	Able to design and carry out research to produce alternative solutions to problems in mathematics education and publish the results.
	PLO8	Able to design and carry out business in the field of education by utilizing science and technology.

	Code	PLO
General Skill	PLO9	Able to apply logical, critical, systematic, and innovative thinking and demonstrate independent, quality, and measurable performance in developing and implementing science and technology based on scientific ethics in order to generate ideas, designs and solutions in accordance with the field of science in the form of a documented thesis to ensure authenticity and prevent plagiarism
	PLO10	Able to maintain social relations with supervisors, colleagues, colleagues both inside and outside the institution, have a leadership spirit, evaluate performance in the team
Attitude	PLO11	Able to show religious attitude, social attitude, responsible, independent, entrepreneurial spirit and able to internalize academic values, norms, and ethics according to their field of expertise
	PLO12	Contribute to improving the quality of life in society, nation and state which is realized with a spirit of nationalism, respect for diversity, commitment, discipline and obey the law

The following curriculum is presented:

Code	Name of Course	Credit Unit (CU)	ECTS
	1st Semester		
UNI620101	Islamic education*	3(2-1)	4.77
UNI620102	Catholic education *	3(2-1)	4.77
UNI620103	Christian education*	3(2-1)	4.77
UNI620104	Hindu education *	3(2-1)	4.77
UNI620105	Buddhist education*	3(2-1)	4.77
UNI620108	Pancasila education	2(2-0)	3.18
KIP620101	Fundamental of education	2(2-0)	3.18
KMT620101	A basic introduction to mathematics	3(3-0)	4.77
KMT620102	Geometry	3(3-0)	4.77
KMT620103	Two dimension – analytic geometry	2(2-0)	3.18
KMT620104	Capita Selecta of mathematics for elementary school	2(2-0)	3.18
KIE620108	Basics natural science	3(3-0)	4.77
Total Credit 1st Semester		**20 (19-1)**	**31.8**
	2nd Semester		
UNI620106	Indonesian language education	2(2-0)	3.18
UNI620107	Civic education	2(2-0)	3.18
KIP620102	Educational psychology	2(2-0)	3.18
KIP620104	Teaching and Learning	2(2-0)	3.18
KMT620105	Number theory	2(2-0)	3.18
KMT620108	Trigonometry	2(2-0)	3.18
KMT620106	Matrix algebra	2(2-0)	3.18
KMT620105	Differential calculus	3(3-0)	4.77
KMT620107	Three dimension – analytic geometry	2(2-0)	3.18
KMT620110	English Teacher Profession	2(2-0)	3.18
KMT620111	Graph theory	2(2-0)	3.18
Total Credit 2nd Semester		**23 (23-0)**	**36.57**

	3rd Semester		
KIP620201	Management of education	2(2-0)	3.18
UNI620209	Entrepreneurship	3(2-1)	4.77
KMT620202	Vector algebra	2(2-0)	3.18
KMT620203	Integral calculus	3(3-0)	4.77
KMT620204	Capita Selecta of secondary education mathematics	3(3-0)	4.77
KMT620205	Statistics	3(2-1)	4.77
KMT620206	History and philosophy of mathematics	2(2-0)	3.18
KMT620207	Transformational geometry	3(3-0)	4.77
KMT620308	Study of mathematics education problem	2(2-0)	3.18
Total Credit 3rd Semester		**23(21-2)**	**36.57**
	4th Semester		
KMT620209	Capita Selecta of high schools education mathematics	3(3-0)	4.77
KMT620210	Multivariable calculus	3(3-0)	4.77
KMT620211	Probability theory	3(3-0)	4.77
KMT620212	Group theory	3(3-0)	4.77
KMT620213	Mathematics learning strategies	3(2-1)	4.77
KMT620214	Vector Analysis	2(2-0)	3.18
KMT620215	Discrete mathematics	3(3-0)	4.77
KMT620216	Research Methodology in Mathematics Education	3(2-1)	4.77
Total Credit 4th Semester		**23(21-2)**	**36.57**

	5th semester		
KMT620301	ICT literacy and Mathematics learning media	3(2-1)	4.77
KMT620302	Differential equations	3(3-0)	4.77
KMT620303	Mathematics learning design	4(2-2)	6.36
KMT620304	Mathematical statistics	3(3-0)	4.77
KMT620305	Introduction to real analysis	3(3-0)	4.77
KMT620306	Mathematics learning and education evaluation	3(2-1)	4.77
KMT620307	Numerical method	3(2-1)	4.77
KMT620324	Linear programming	2(2-0)	3.18
Total Credit 5th Semester		**24(19-5)**	38.16
	6th Semester		
KMT620308	Initial value and boundary condition	3(3-0)	4.77
KMT620309	Financial Mathematics	2(2-0)	3.18
KMT620310	Micro teaching	3(0-3)	4.77
Total Credit 6th Semester		**8(5-3)**	**12,72**
UNI620401	Student Community service (KKN)	3(0-3)	4.77
KIP620401	Teaching Internship 1 (PLP 1)	1(0-1)	1.59
KIP620402	Teaching Internship 2 (PLP 2)	3(0-3)	4.77
KMT620401	Research essay proposal seminar	1(0-1)	1.59
Total Credit 7th Semester		**8 (0-8)**	12,72
	8th semester		
KMT620402	Research essay results seminar	1(0-1)	1.59
KMT620403	Research essay	4(0-4)	6.36
Total Credit 8th Semester		**5 (0-5)**	7,86
	TOTAL (credits)	134 (108-26)	212,97

Electives:

No	Code	Name of Courses	CU	ECTS
1	KMT620311	Axiomatic geometry	2(2-0)	3.18
2	KMT620312	Econometrics	2(2-0)	3.18
3	KMT620313	Complex Analysis	2(2-0)	3.18
4	KMT620314	Multivariable data analysis	3(1-2)	4.77
5	KMT620315	Real Analysis	2(2-0)	3.18
6	KMT620316	Mathematical modelling	2(2-0)	3.18
7	KMT620317	Ring theory	2(2-0)	3.18
8	KMT620318	Drawing geometry	2(2-0)	3.18
9	KMT620319	Mathematical thinking skill	2(2-0)	3.18
10	KMT620320	Topology	2(2-0)	3.18
11	KMT620321	Ethno mathematics	2(2-0)	3.18
12	KMT620322	Partial differential equation	2(2-0)	3.18
13	KMT620323	Computer programming	3(2-1)	4.77

According to the Self-Assessment Report, the following **Programme Education Objectives (PEO)** shall be achieved by the Bachelor's degree programme Physics Education:

UPPE	1. Developing graduates able to master the knowledge, skills and application of physics and physics education in solving problems in the field of work that supports a professional career.
	2. Developing graduates able to take responsibility for work in their area of expertise and internalize the spirit of independence and cooperation.
	3. Developing graduates able to communicate and socialize professional activities at local, national, regional and international levels.

The following Programme Learning Outcomes (PLO) are presented:

Competency SSC-ASIIN	Aspect	PLO	Description
Specialist Competences	Knowledge	PLO1	Demonstrate knowledge of classical physics (mechanics, electrodynamics, thermodynamics, oscillations, waves and optics) and are familiar with the fundamentals of quantum, atomic and molecular, nuclear, elementary particle and solid state physics.
		PLO2	Formulate physical systems using mathematics to solve physics problems.
		PLO3	Applying Technology, Pedagogy, and Content Knowledge (TPACK) in planning, teaching, and evaluating physics learning.
		PLO4	Using research methodology knowledge to solve physics education and learning problems.
	Special Skills	PLO5	Able to plan, implement, and evaluate physics learning based on learning activities to develop critical thinking, creativity, and problem solving skills.
		PLO6	Able to plan and carry out physics education research to solve physics learning problems.
		PLO7	Able to develop physics learning resources according to the needs and development of science and technology.
		PLO8	Able to manage, use, and develop physics learning laboratory tools.
Social Competences	General Skills	PLO9	Able to compile and publish scientific papers both in writing and verbally effectively.
	Attitude	PLO10	Demonstrate a responsible attitude towards work in their area of expertise both independently and in groups; and

Competency SSC-ASIIN	Aspect	PLO	Description
			internalize the spirit of independence, cooperation, and entrepreneurship.
		PLO11	Uphold religious, moral, ethical, and human values in carrying out their duties

The following curriculum is presented:

No	COURSES		CU	ECTS
	CODE	NAME		
	The 1st Semester			
1	UNI616101	Islamic Religion Education*)	3	4,8
2	UNI616102	Catholic Religion Education*	3	4,8
3	UNI616103	Christian Religion Education*)	3	4,8
4	UNI616104	Hindu Religion Education*)	3	4,8
5	UNI616105	Buddha Religion Education*)	3	4,8
6	UNI617108	Pancasila Education*	2	3,2
7	UNI617109	Entrepreneurship	2	3,2
8	KIP620101	Fundamental of Education*	2	3,2
9	KIP620103	Scouting Education*	1	1,6
10	KIE616101	Basic Mathematics*	3	4,8
11	KIE616104	General Chemistry*	3	4,8
12	KIE616103	General Biology*	3	4,8
13	KFI620101	English for Physics Education	2	3,2
14	KFI620102	Fundamentals of Mechanics and Thermodynamics	3	4,8
	The 2nd Semester			
1	UNI616106	Indonesian	2	3,2
2	UNI616107	Citizenship Education	2	3,2
3	KIP620102	Educational Psychology	2	3,2
4	KIP620104	Teaching and Learning	2	3,2
5	KFI620103	Basic Physical Mathematics	3	4,8
6	KFI620104	Fundamentals of Waves and Electrodynamics	3	4,8
7	KFI620105	Science Laboratory Management	3	4,8
8	KFI620106	History of Physics Development	2	3,2
9	KFI620107	Physics Instrumentation	2	3,2
10	KFI620108	Physics Learning Strategy	3	4,8

The 3rd Semester				
1	KFI620201	Advanced Physical Mathematics	3	4,8
2	KFI620202	Mechanics	3	4,8
3	KFI620203	Earth and Space Sciences	3	4,8
4	KFI620204	Waves	3	4,8
5	KFI620206	Physics Learning Evaluation	3	4,8
6	KFI620205	Basic Electronics	3	4,8
7	KFI620207	Learning Multimedia for Physics	3	4,8
The 4th Semester				
1	KFI620208	Optics	3	4,8
2	KFI620209	Electricity and Magnetism	3	4,8
3	KFI620210	Modern Physics	3	4,8
4	KFI620214	Physics Learning Plans	3	4,8
5	KFI620211	Educational Research Methodology	3	4,8
6	KFI620212	Thermodynamics	3	4,8
7	KFI620212	Statistics	3	4,8
The 5th Semester				
1	KFI620211	School Physics	3	4,8
2	KFI620213	ICT-based Physics Learning	3	4,8
3	KFI620213	Quantum Physics	3	4,8
4	KFI620211	Atomics Nuclei and Radioactivity	3	4,8
5	KFI620212	Microteaching	3	4,8
6	KFI620306	Studies of Physics Educational Research Results	2	3,2
7	KFI620307	Modern Optics**2)	3	4,8
8	KFI620308	Advanced Physics Instrumentation**2)	3	4,8
9	KFI620309	Earth Physics**)	3	4,8
10	KFI620310	Medical Physics**2)	3	4,8
11	KFI620311	Solid State Physics**2)	3	4,8
12	KFI620312	Statistical Physics**2)	3	4,8

The 6th Semester				
1	KFI620313	Research Instrument Design and Evaluation**1)	3	4,8
2	KFI620314	Research of Education Policies**1)	3	4,8
3	KFI620315	Evaluation of Educational Programme**1)	3	4,8
4	KFI620316	Measurement and Testing**1)	3	4,8
5	KFI620317	Data Analysis and Report**1)	3	4,8
6	KFI620318	Theory of Relativity**2)	3	4,8
7	KFI620319	Development of Practical Simulation**3)	3	4,8
8	KFI620320	Development of Android-based Application **3)	3	4,8
9	KFI620321	Laboratory Technique**4)	3	4,8
10	KFI620322	Production of Science Laboratory Equipment**4)	3	4,8
11	KFI620323	Environment-based Learning Laboratory**4)	3	4,8
12	KFI620324	Digital Electronics**4)	3	4,8
13	KFI620325	E-learning Installation**3)	3	4,8
14	KFI620326	E-learning Development**3)	3	4,8
15	KFI620327	CBT Development**3)	3	4,8
16	KFI620328	Physics Visualization**3)	3	4,8
17	KFI620329	Development of Digital Physics Teaching Materials**3)	3	4,8
18	KFI620330	Development of Physics Learning Video**3)	3	4,8
19	KFI620331	Authentic Assessment**)	3	4,8
20	KFI620332	Laboratory Equipment Maintenance and Repair**)	3	4,8
21	KFI620333	Production of Digital Measuring Instrument**4)	3	4,8
22	KFI620334	Computational Physics**2)	3	4,8
23	KFI620335	Environmental Physics**)	3	4,8
24	KFI620336	STEM Education**)	3	4,8
25	KFI620337	Digital Literacy**)	3	4,8
26	KFI620338	Physics Learning Design Models**)	3	4,8
27	KFI620339	Electromagnetic Field**)	3	4,8
28	KFI620340	Development of e-Assesment**)	3	4,8

The 7th Semester				
1	KIP620401	Teaching Internship 1	1	1,6
2	KIP620402	Teaching Internship 2	3	4,8
3	UNI620401	Community Service Program (KKN)	3	4,8
4	KFI620401	Research Proposal Seminar	1	1,6
5	KFI620402	Research Result Seminar	1	1,6
6	KFI620403	Thesis	4	6,4