ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Biology
Biology Education
Chemistry
Chemistry Education

Master's Degree Programmes
Biology Education
Chemistry Education

Provided by
Universitas Negeri Jakarta, Indonesia

Version: 22 September 2023

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]
Program Studi Sarjana Biologi	Undergraduate programme in Biology	ASIIN	BAN-PT: B 2018 - 2023	10
Program Studi Sarjana Pendidikan Biologi	Undergraduate programme in Biology Education	ASIIN	BAN-PT: A 2021 - 2026	10
Program Magister Pendidikan Biologi	Master programme in Biology Education	ASIIN	BAN-PT: B 2017 - 2022	10
Program Studi Sarjana Kimia	Undergraduate programme in Chemistry	ASIIN	BAN-PT: A 2018 - 2023	09
Program Studi Sarjana Pendidikan Kimia	Undergraduate programme in Chemistry Education	ASIIN	BAN-PT: A 2021 - 2026	09
Program Magister Pendidikan Kimia	Master programme in Chemistry Education	ASIIN	BAN-PT: B 2017 - 2022	09
Date of the contract: 03.06.2021 **Submission of the final version of the self-assessment report:** 17.02.2022 **Date of the audit (online):** 14.06. – 15.06.2022				
Peer panel: Medina Andini, SMA Khadijah Surabaya Prof. Dr. Gereon Elbers, University of Applied Sciences Aachen				

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 09 – Chemistry, Pharmacy; TC 10 – Life Sciences

Prof. Dr. Nurma Yunita Indriyanti, Universitas Sebelas Maret Prof. Dr. Angelika Loidl-Stahlhofen, Westphalian University of Applied Sciences Dwika Sarnia Putri, Universitas Sebelas Maret, student	
Representative of the ASIIN headquarter: Rainer Arnold	
Responsible decision-making committee: 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, Pharmacy as of 29.03.2019 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019	

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Undergraduate programme in Biology	Sarjana Sains / Bachelor of Science in Biology	-	6	Full time	no	8 Semester	144 SKS / 216 ECTS	once a year (August)
Undergraduate programme in Biology Education	Sarjana Pendidikan/ Bachelor of Education in Biology	-	6	Full time	no	8 Semester	144 SKS / 216 ECTS	once a year (August)
Program Magister Pendidikan Biologi	Magister Pendidikan Biologi / Master in Biology Education	-	7	Full time	no	4 Semester	46 SKS/ 119,6 ECTS	2012 / once a year (August)
Undergraduate programme in Chemistry	Sarjana Sains / Bachelor of Science in Chemistry	-	6	Full time	no	8 Semester	144 SKS / 216 ECTS	once a year (August)
Undergraduate programme in Chemistry Education	Sarjana Pendidikan/ Bachelor of Education in Chemistry	-	6	Full time	no	8 Semester	145 SKS / 217.5 ECTS	once a year (August)
Program Magister Pendidikan Kimia	Magister Pendidikan Kimia / Master in Chemistry Education	-	7	Full time	no	4 Semester	49 SKS/ 127.4 ECTS	2012 / once a year (August)

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

The mission of the Faculty of Mathematics and Natural Sciences (FMIPA) of Universitas Negeri Jakarta (UNJ) is:

1. To conduct a certified education and teaching activity using information technology and communication to create a graduate compliant with stakeholder requirements and competitive in Asia.
2. To build conducive academic circumstances, generate religious circumstances during academic and non-academic activity, and grow entrepreneurship ability for the students.
3. To conduct research and developments in Mathematics and Science study programme, and Mathematics and Science Education study programme following the development of science and technology.
4. To conduct community services relevant to Mathematics and Science study programmes.
5. To establish and develop a partnership with various national and international institutions.

For the Bachelor's degree programme Biology, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1.	Scientists and academics,	Be able to design, develop research in the laboratory and field study, transfer their knowledge, and promote them for further study.
2.	Practitioners in laboratory and industry	Be able to manage, analyze, and make decisions on data given, carry their duty responsibly, have rigid laboratory safety standards, including occupational health and safety concepts, excellent communication, good problem-solving skills, and a good understanding of ethics.

For the Bachelor's degree programme Biology Education, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1	Educators in the field of Biology	Be able to plan, develop, implement, and evaluate biology learning professionally, globally competitively, and demonstrate professional ethics and self-development.
2	Biology Laboratory Manager	Be able to manage the biology education laboratory by paying attention to aspects of safety, occupational health, and environment according to national and or international standards, demonstrating professional ethics and self-development.
3	Entrepreneur	Be able to design, implement and evaluate entrepreneurial activities in biology and biology education professionally.

For the Master's degree programme Biology Education, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1	Educators	Be able to design, implement, and appropriately evaluate technology-based biology learning.
2	Researchers in Biology Education	Be qualified and active in national and international scientific forums and publish research results in accredited national and international journals.
3	Consultant and Developer in Biology Education	Be able to have the ability to analyze curriculum, learning media, and evaluation problems in the biology education field, thus providing appropriate solutions.

For the Bachelor's degree programme Chemistry, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1	Scientist and academics	Be able to develop themselves professionally and sustainably in studies to a higher level both formally and informally (certification), provide alternative solutions to chemistry problem-solving, compile scientific papers, and communicate them effectively.
2	Industry practitioners	Be able to apply chemical concepts and develop themselves professionally in problem-solving in applied chemistry relevant to the industry.
3	Science entrepreneurs	Be able to develop and apply entrepreneurial principles in the relevant chemical field.

For the Bachelor's degree programme Chemistry Education, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1	Chemistry educators	Be able to have excellent professional, pedagogic, social competence, and personal competencies.
2	Novice researchers	Be able to conduct research based on research methodology applied in fieldwork.
3	Entrepreneurs	Be able to develop and apply entrepreneurial values in relevant chemistry education fields.

For the Master's degree programme Chemistry Education, Universitas Negeri Jakarta (UNJ) has presented the following occupation profile in its Self-Assessment Report:

No	Occupational Profile	Specifications
1	Professional educator	Professional educators at the secondary and higher education levels have in-depth knowledge of TPACK (Technological Pedagogical and Content Knowledge) and apply the concept of Green Chemistry to the chemistry learning process.
2	Education Manager	Education Managers and Policy Holders have competitive advantages in global competition and have social competence.
3	Researcher	Educational Researchers who have a critical understanding of solving academic problems and can communicate that implements lifelong learning and social competence in their life.

C Peer 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 of the degree programmes
- Module descriptions
- Webpage Faculty of Mathematics and Natural Sciences: https://fmipa.unj.ac.id/mipabaru/en/
- Webpage Ba Biology: https://fmipa.unj.ac.id/biologi/en/
- Webpage Ba Biology Education: https://fmipa.unj.ac.id/pbiologi/
- Webpage Ma Biology Education: https://fmipa.unj.ac.id/s2biologi/en/
- Webpage Ba Chemistry: https://fmipa.unj.ac.id/kimia/?lang=en
- Webpage Ba Chemistry Education: https://fmipa.unj.ac.id/pkimia/
- Webpage Ma Chemistry Education: https://fmipa.unj.ac.id/s2pendkimia/en/
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The peers base their assessment of the learning outcomes on the information provided on the websites and in the Self-Assessment Report of all six degree programmes under review.

For all programmes, Universitas Negeri Jakarta (UNJ) 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 Mathematics and Natural Sciences (FMIPA), the PLO cover a number of specific competences students should acquire in their respective degree programme. Both, PEO and PLO of each degree programme are published on the programme's website. Finally, there are the Course Learning Outcomes (CLO), which are the specific goals of each course or module. The CLO are listed in the module description of each course.

The peers 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 programmes Biology, Biology Education, and the Master's degree programme Biology Education as defined by UNJ correspond to the competences as outlined by the SSC. They come to the following conclusions:

Graduates of the Bachelor's degree programme Biology should understand the basic biological processes and should be capable of applying the scientific and technological methods of the biological sciences. In addition, graduates should acquire relevant scientific knowledge in the different biological areas such as botany, zoology, biochemistry, biostatistics, molecular biology, cell biology, ecology, plant & animal physiology, and related natural sciences (chemistry, physics). They learn to work in a team and to carry out practical work in a laboratory and in the field. In addition, graduates should be able to work scientifically and be familiar with technological innovations and the use and preservation of biological resources.

The programme is designed as a general biology programme with some specialization options by selecting elective modules and particularly in the course of the final research project. The programme educational objectives and learning outcomes are expected to equip the graduates with life skills required to develop and adapt to the wide spectrum of possible occupations. Biology graduates have a broad occupational area. Their occupational profile includes researcher, teacher/lecturer, entrepreneur, and they could work in industry, academia, or public institutions.

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 laboratory managers, graduates should be able to examine issues in biology and biology learning by implementing scientific methods. As entrepreneurs, graduates should be qualified to manage a business unit and to develop local biological-based business ideas through innovation and creativity.

The goal of the Master's degree programme Biology Education is to impart the necessary professional skills (pedagogic, personal, and social) in biology, which are needed to become a successful teacher, education manager, or researcher. To this end, graduates should master advanced theoretical principles in biology and be able to plan and conduct advanced biological experiments. In addition, they should understand the field of biology education in theory and practice, to develop and apply biology teaching techniques and methods, and to analyse education management policies and curricula. Finally, they should be able to design and carry out complex research activities in the area of biology education, and be able to take over leadership functions in the education sector.

The peers 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, Chemistry Education, and the Master's degree programme Chemistry Education as defined by UNJ, correspond with the competences as outlined by the SSC. They come to the following conclusions:

The goal of the Bachelor's degree programme Chemistry is to impart essential competencies in mathematics, the natural sciences and the core subjects of chemical sciences (biochemistry, organic, inorganic, physical, and analytical chemistry). In addition, the graduates should learn about the different substance classes, their properties, reaction possibilities and uses, and be able to independently plan and carry out practical work. They also should be familiar with modern experimental methods of chemistry, the safe handling of chemicals, have a sound knowledge of safety and environmental issues and the underlying legal framework, and be able to interpret, critically assess, present and communicate relevant information and new research results, and to discuss them with specialist colleagues. Moreover, the graduates should be capable of using the acquired knowledge and skills to find solutions to practical chemical problems and for conducting scientific work. Finally, they should be familiar with chemical hazards and problems that are relevant for the community and be able to apply appropriate means to solve these problems, in order to improve the quality of people's lives. The programme is designed as a general chemistry programme with some specialization options by selection of elective modules and in particular in the course of the final research project.

Graduates of the Bachelor's degree programme Chemistry have several job opportunities; they can work in the chemical or petrochemical industry, as teachers, at universities as well

as in research institutes or in the public administration. The majority of chemistry graduates work in sectors such as chemical and pharmaceutical industry, oil and gas companies, mining and polymer industries, environmental research and monitoring institutions, public agencies, and educational institutions by becoming teachers or lecturers.

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 utilizing 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 goal of the Master's degree programme Chemistry Education is to impart the necessary professional skills (pedagogic, personal, and social) in chemistry, which are needed to become a successful teacher, education manager, or researcher. To this end, graduates should master advanced theoretical principles in chemistry and be able to plan and conduct advanced chemical experiments. In addition, they should understand the field of chemistry education in theory and practice, to develop and apply chemistry teaching techniques and methods, and to analyse education management policies and curricula. Finally, they should be able to design and carry out complex research activities in the area of chemistry education, and consequently take over leadership functions in the education sector.

Supplementing the subject-related qualification objectives, students of all degree 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 log-

ical abilities, be able to apply information and communication technology, and show a social and academic attitude. Finally, students should acquire communicative and language skills and should develop a strategy for life-long learning.

Some graduates of the Master's programmes continue with their academic education and join a PhD programme, but most become teachers at high schools. However, they receive a higher salary and have a higher position than Bachelor graduates usually have. In addition, they can teach at universities or work as consultants in the area of education.

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

The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification of level 6 (Bachelor) and 7 (Master) of the European Qualification Framework. In addition, the programmes correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences (Ba Biology, Ba Biology Education, and Ma Biology Education) and the SSC of the Technical Committee 09 – Chemistry, Pharmacy (Ba Chemistry, Ba Chemistry Education, and Ma Chemistry Education).

Criterion 1.2 Name of the degree programmes

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the peers:
UNJ awards a Bachelor of Science (B.Sc.) or Sarjana Sains (S.Si.) degree to the graduates of the Bachelor's degree programmes Biology and Chemistry, a Bachelor of Education (B.Ed.) or Sarjana Pendidikan (S.Pd.) degree to the graduates of the Bachelor's degree programmes Biology Education and Chemistry Education, and a Master of Education or Magister Pendidikan (M.Pd.) to the graduates of the Master's degree programmes Biology Education and Chemistry Education.

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

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- UNJ Academic Guidelines
- Webpage Faculty of Mathematics and Natural Sciences: https://fmipa.unj.ac.id/mip-abaru/en/
- Webpage Ba Biology: https://fmipa.unj.ac.id/biologi/en/
- Webpage Ba Biology Education: https://fmipa.unj.ac.id/pbiologi/
- Webpage Ma Biology Education: https://fmipa.unj.ac.id/s2biologi/en/
- Webpage Ba Chemistry: https://fmipa.unj.ac.id/kimia/?lang=en
- Webpage Ba Chemistry Education: https://fmipa.unj.ac.id/pkimia/
- Webpage Ma Chemistry Education: https://fmipa.unj.ac.id/s2pendkimia/en/
- Discussions during the audit

Preliminary assessment and analysis of the peers:
All six degree programmes under review are offered by the Faculty of Mathematics and Natural Sciences (FMIPA) of Universitas Negeri Jakarta (UNJ).

The Bachelor's degree programmes under review are designed for four years and are offered as full-time programmes. In the Biology, Biology Education and Chemistry programmes, 144 credit semester units (SKS) need to be achieved by the students (this is equivalent to 216 ECTS points). The curriculum of the Chemistry Education programme encompasses 145 SKS (217.5 ECTS points). The Master's degree programmes Biology Education and Chemistry Education are also full time study programmes, which are designed for two years and encompass 46 SKS (119,6 ECTS points) for Biology Education and 49 SKS (127,4 ECTS points) for Chemistry Education.

All undergraduate programmes at UNJ are designed to be completed in 8 semesters or four academic years with a maximum of 14 semesters or 7 academic 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 last from February to July.

The curricula of the Bachelor's programmes consist of university requirements and compulsory and elective courses determined by UNJ and the respective departments. University requirements such as Language, Sports, Pancasila, Religion, and Social and Cultural Sciences are courses that need to be attended by all undergraduate students at UNJ. These courses are usually offered in the first two semesters of studies, in addition to courses conveying basic knowledge of natural sciences and mathematics.

Courses on the different subject-specific sciences and education 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 last two semesters, students must also complete the undergraduate thesis (6 SKS) and the community service (2 SKS).

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

The peers discuss with the programme coordinators in which courses practical work in schools is included. They learn that for providing in-field learning experience, the educational undergraduate programmes include a school internship programme. Students will spend at least six weeks at a school in order to gain practical teaching experience. They also learn pedagogical strategies from their mentor teacher at the school. By the end of the programme, students are required to write a fieldwork report. The final grade for the internship programme is based on the students' performance at the school and the fieldwork/internship they submit. During the discussion, the UNJ explains that students' „creativity" during the internship is one of the assessed criteria. The peers do not quite agree

with this assessment criterion, because it is very subjective. According to the information provided during the discussions, some students conduct the internship at international school, which means they must teach using an international curriculum (such as IGCSE, A-Level, or IB). Therefore, it would be useful to introduce the students to international curricula and the respective teaching strategies during the educational courses. UNJ has established co-operation agreements with several schools for conducting their teaching internship there. Moreover, students can conduct the community service in schools all around Indonesia and students can also go for their teaching internship.

Since UNJ has the goal to become internationally more visible and aims for further internationalising its degree programmes, the peers discuss with the programme coordinators and students if any classes at FMIPA are taught in English. The programme coordinators explain that there is not yet an international class, neither in the biology nor in the chemistry programmes. However, English textbooks are used and some presentations are done in English. In addition, some international guest lectures are invited, who give classes in English. Nevertheless, the peers are convinced that it would be very useful to offer an international class in the undergraduate programmes, in which all lectures are delivered in English. In addition, the undergraduate programme should also put more English courses into their curricula. This would further improve the students' English proficiency and better prepare them for the job market. In the discussion with the peers, students and alumni support this point of view.

The members of the teaching staff explain on demand of the peers that they offer possible topics for the final projects according to their own research projects. All members of the teaching staff supervise theses; teachers may not supervise more than seven students conducting their final projects. 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 or thesis 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 and it is possible to conduct the Bachelor's thesis outside UNJ.

The Master's degree programmes Biology Education and Chemistry Education are designed for a minimum study period of four and a maximum of eight semesters. Students conduct research activities and write a thesis related to their research field in the final year. In addition, Master's students need to present their research results at an international conference or submit them to an international journal.

The study plans are aligned with the Indonesian National Qualifications Framework, the National Higher Education Standards, and the Indonesian Chemistry and Biology Consortium standards. The Master's programmes consist of two groups of courses, namely general university courses and programme specific courses (compulsory courses and electives).

The peers gain the impression that the graduates of all degree programmes under review are well prepared for entering the labour market and can find adequate jobs in Indonesia. Most of the Bachelor's graduates enter the job market directly, only few continue with a Master's degree either at UNJ or at other universities. Most of the graduates work for private companies and there is still a high demand from the industry for Bachelor's graduates in chemistry and biology. Consequently, the job perspectives are very good, and most of the graduates start their first job within three months after graduation.

During the audit, the peers learn that UNJ does not offer any "regular" Master's programmes in biology and chemistry. For further promoting UNJ's academic development and achieving the goal of becoming a reputable university in Asia, FMIPA should think about establishing "regular" Master's programmes in biology and chemistry

In general, the peers confirm that all degree programmes under review are well designed and impart a broad range of competencies so that graduates can find suitable jobs as teachers, educators, researchers, and entrepreneurs. The peers gain the impression that the graduates of all degree programmes under review are well prepared for entering the labour market and have good and manyfold job perspectives in Indonesia.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- UNJ Academic Guidelines
- Webpage UNJ: https://www.unj.ac.id/
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report, admission procedures and policies for new students follow the national regulations in Indonesia. The requirements, schedule, registration venue, and selection test are announced on UNJ's webpage and thus accessible for all stakeholders.

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

1. National Entrance Selection of State Universities (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), a national admission system, which is based on the academic performance during the high school.

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

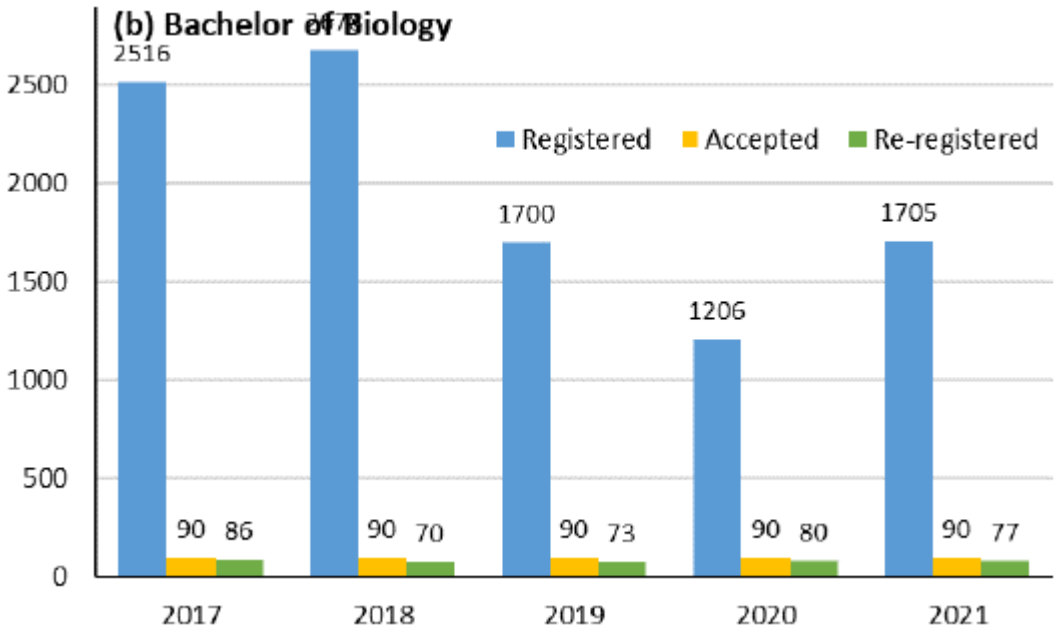
3. UNJ Independent Selection (MANDIRI) students are selected based on a test specifically held by UNJ for prospective students that haven not been accepted through SNMPTN or SBMPTN.

The entrance requirements are prepared by the universities and then forwarded to the National Testing Agency for State Universities to be accessible to all SNMPTN and SBMPTN applicants. The percentage of undergraduate students accepted through SNMPTN is 30 %, through SBMPTN 40 %, and through the independent test selection (MANDIRI) 30 %.

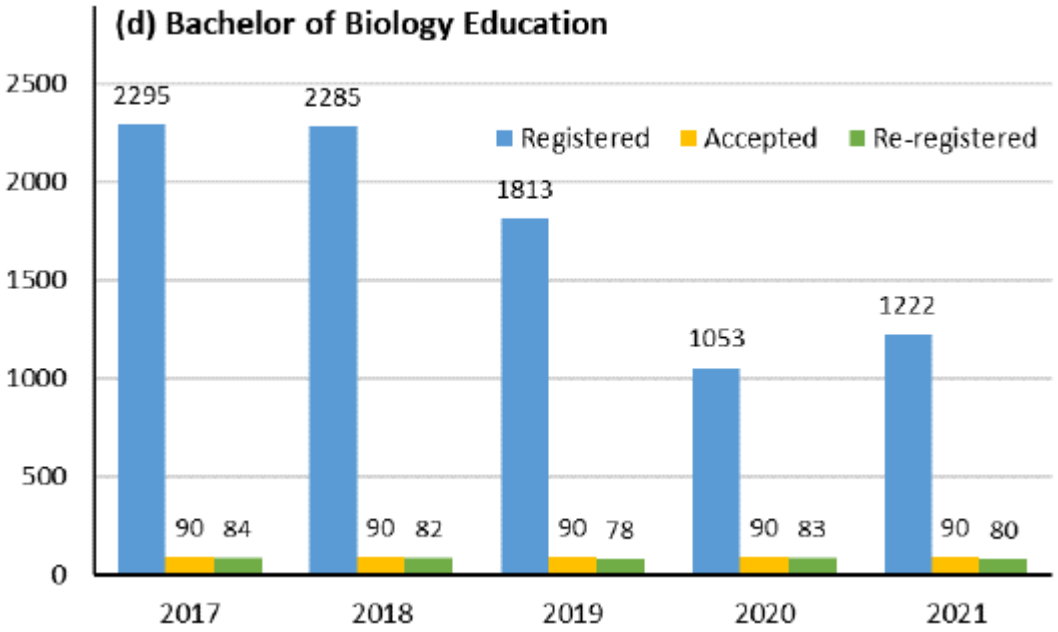
The number of available study places is between 70 to 90 students per year in all undergraduate programmes. The quota is based on the number of teachers and the capacity of the available facilities.

The details are depicted in the following diagrams:

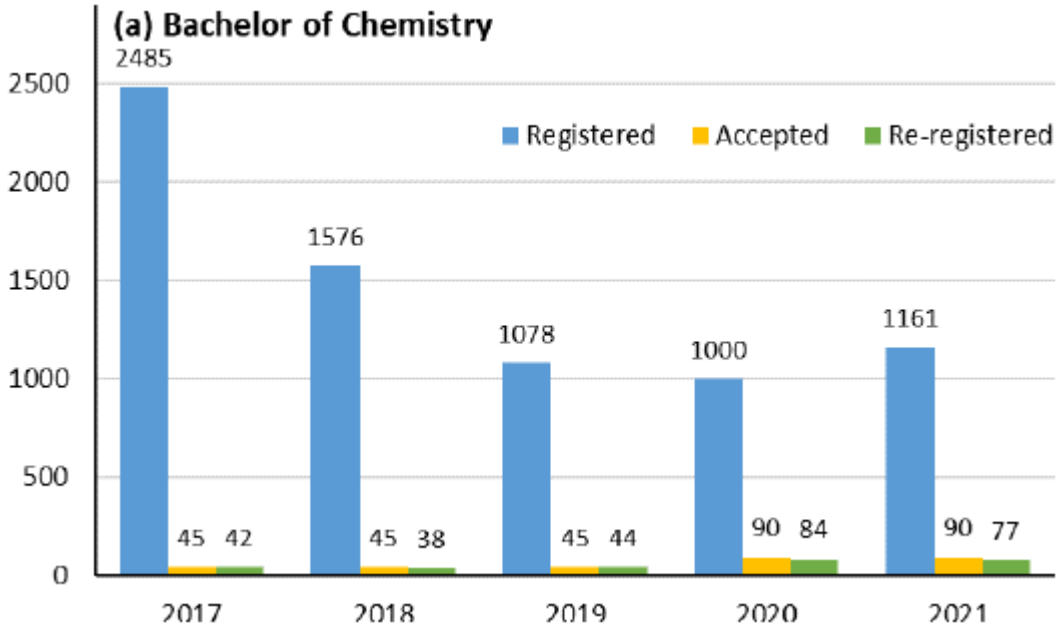
Ba Biology:



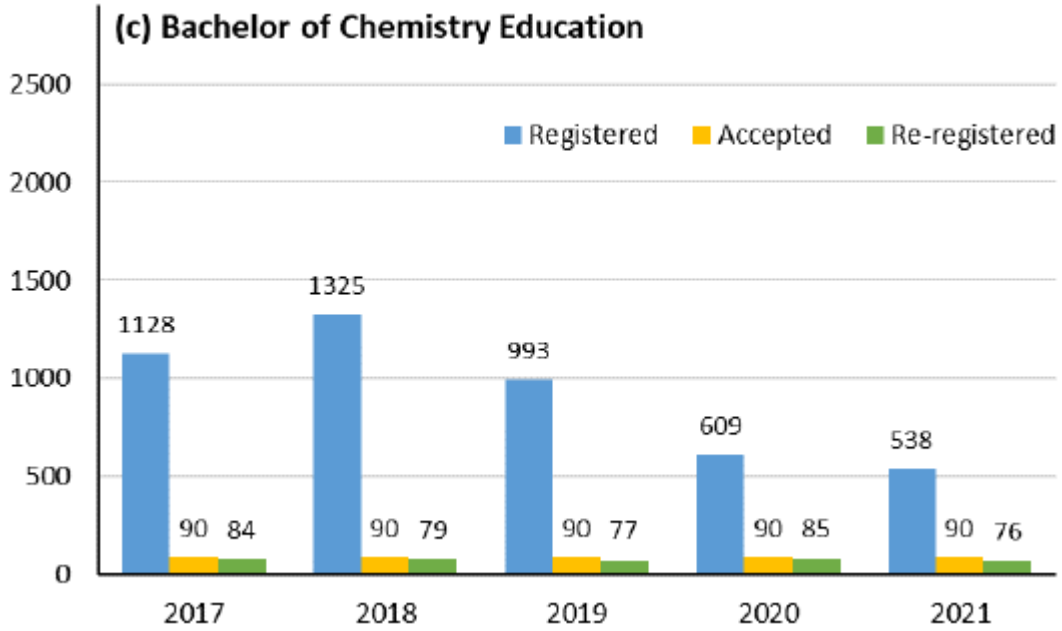
Ba Biology Education:



Ba Chemistry:



Ba Chemistry Education:



Source: UNJ Self-Assessment Report

All four Bachelor's degree programme offer 90 new study places per year. The number of applications exceed this by far. Within the last five years, between 500 and 2500 high school graduates have applied for admission to the four Bachelor's degree programmes. The demand for the biology programmes is higher than for the chemistry programmes. As a result, the Bachelor's programme Biology has an average acceptance rate of 4.6 % and the Bachelor's programme Biology Education of 5.2 %. The acceptance rates in the chemistry programmes with 6.2 % (Ba Chemistry) and 9.8 % (Ba Chemistry Education) are a little higher.

The admission for the Master's programmes is carried out via an independent selection test (MANDIRI). The admission is based on the previous level of academic education and the academic requirements as well as the ability to communicate in English, as demonstrated by an English proficiency certificate. Applicants need to have a Bachelor's degree in the respective subject (chemistry or biology) but they do not need to have an educational background but can also have a degree in "pure" chemistry or biology. If they do not have any educational or teaching experience, Master's students have to attend an educational course in the Master's programme. However, the peers think that it would be useful to require students with a pure science background to attend more pedagogical courses.

The admission procedure includes an interview and a written test (academic potential test). During the audit, the programme coordinators explain that the students' motivation and their ideas for research activities are discussed in the admission interview. The peers notice that just one teacher each currently conducts the 30 minutes long interviews. They point out that it would be more appropriate to have at least two interviewers for each applicant.

This way, the out-come of the interview will be impartial. In addition, UNJ should provide a guideline for conducting the interview with the criteria, interview topics, and a score sheet.

Depending on the results, students can be admitted to the Master's programmes. From 2017 to 2021, between 24 and 13 new students have been admitted per year to each of the two Master's degree programmes.

All students at UNJ have to pay tuition fees (UKT). There are eight different levels of tuitions fees, depending on the financial ability of the parents. Currently, the fees range from IDR 500 000 (EUR 35) to IDR 10 00 000 (EUR 700) for the undergraduate programmes per year. The tuition fees for the Master's programmes are fixed and do not depend on the parents' economic situation. Currently, Master's students have to pay a tuition fee of IDR 10 00 000 (EUR 700) from the first semester to the fourth semester and 4.600.000 IDR (320 EUR) for higher semesters. In addition, several grants for students with financial difficulties or for students with a high academic performance are available, e.g. from the government, industries, foundations, and other public and private institutions. Some senior students work as laboratory assistants to earn some money for financing their studies.

The details of the application process at UNJ and further information on admissions criteria and deadlines can be found in the National Regulation No. 2, 2015 and the UNJ Academic Guidelines, which are also published on the university's webpage.

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

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

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

The peers appreciate that UNJ has started to involve two teachers in the interviews for the applicant of the master's programmes. This will help to obtain a more objective decision for students' admission.

The peers consider criterion 1 to be mostly fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage Faculty of Mathematics and Natural Sciences: https://fmipa.unj.ac.id/mipabaru/en/
- Webpage Ba Biology: https://fmipa.unj.ac.id/biologi/en/
- Webpage Ba Biology Education: https://fmipa.unj.ac.id/pbiologi/
- Webpage Ma Biology Education: https://fmipa.unj.ac.id/s2biologi/en/
- Webpage Ba Chemistry: https://fmipa.unj.ac.id/kimia/?lang=en
- Webpage Ba Chemistry Education: https://fmipa.unj.ac.id/pkimia/
- Webpage Ma Chemistry Education: https://fmipa.unj.ac.id/s2pendkimia/en/
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The curriculum of the Bachelor's degree programmes under review are designed for eight semesters. Nevertheless, it is also possible for excellent students to complete the degree in only seven semesters. Students cannot cover more than 24 SKS per semester. All students have to complete the undergraduate programme within seven years. The students' individual study plans are different from each other, but have to be approved by their academic advisors.

A systematic university-wide review of the curriculum is conducted every five years but minor changes may be implemented every year after endorsement by FMIPA.

The curriculum of the Bachelor's degree programme Biology focuses on basic knowledge of mathematics and natural science in the first two semesters. From the second year of studies, more subject-specific courses in statistics, biodiversity and biosystematics of plants, animals, and microbes are offered. In the third year of studies, students have to take subjects such as animal and plant physiology, molecular biology, and research design. During the last two semesters, students focus on the undergraduate thesis and elective courses that support the thesis.

The general structure of the Bachelor's degree programme Biology is depicted in the following table:

No	Courses Group	Total (In Credits)	Total (In ECTS)
1	University Courses	14	21.0
2	Faculty's Courses	1	1.5
3	Basic Skills Compulsory Course from Biology Study Programme	92	138.0
4	Study Programme Elective Courses	17	25.5
5	Independent Learning Activities Course (MBKM)	20	30.0
Total		144	216.0

The curriculum of the Bachelor's degree programme Biology Education is designed to provide students with the necessary knowledge and skills in biology teaching as well as in biological sciences. The study plan includes general courses with 14 SKS that are compulsory for all undergraduate students, basic educational courses with 7 SKS, faculty courses with 1 SKS, biology courses with 94 SKS, electives with 8 SKS, and MBKM with 20 SKS.

The general structure of the Bachelor's degree programme Biology Education is depicted in the following table:

No	Course Groups	Credits	ECTS
1	General Courses (MKU) /University Courses	14	21.0
2	Faculty Course	1	1.5
3	Pedagogical Courses	7	10.5
4	Compulsory Courses	94	141.0
5	Elective Course	8	12.0
6	MBKM	20	30.0
TOTAL		**144**	**216.0**

As the qualification profile of the Bachelor's degree programme Biology Education includes biology laboratory manager, the curriculum should also focus on courses related to laboratory management. During the discussions, UNJ states that they offer a course to this respect in the first semester, but the provided curriculum shows otherwise.

The Master's programme Biology Education encompasses the areas pedagogy, biology, and thesis. The pedagogy and biology courses impart professional and practical competences, while the thesis is designed to support the graduates in becoming researchers in biology education. The courses are divided into general courses such as "Philosophy of Science", "Statistics of Education", and "Research Methodology", compulsory educational and biology courses, and electives.

The general structure of the Master's degree programme Biology Education is depicted in the following table:

No	Course Group	Credits	ECTS
1	General Course	9	23.4
2	Compulsory Courses	29	75.4
3	Elective Courses	8	20.8
Total		46	119.6

The Bachelor's degree programme Chemistry encompasses 144 SKS, consisting of compulsory and elective courses, and a final project (undergraduate thesis). The compulsory courses (120 SKS) impart general and basic competencies in chemistry. The optional courses consist of 24 SKS including MBKM. Elective courses are categorized into four interest groups, which are biosciences, inorganic chemistry, physical chemistry, and analytical chemistry. The final project has to include practical research activities in the laboratory and the written in the final project report is called undergraduate thesis.

The general structure of the Bachelor's degree programme Chemistry is depicted in the following table:

No	Types of Courses	Total (In Credits)	Total (In ECTS)
1	University's Courses	14	21
2	Faculty's course	1	1.5
3	Compulsory Courses	105	157.5
4	Elective Course	4	6
5	Independent Learning Activities Course (MBKM)	20	30
Total		**144**	**216**

The curriculum of the Bachelor's degree programme Chemistry Education consists of four groups of courses:

a. University Courses for all undergraduate students at UNJ

b. Faculty Courses specifically offered for students at FMIPA

c. Study Programme Courses, which include compulsory and elective courses

d. Pedagogy courses

The compulsory courses encompass 99 SKS and impart general and basic competencies for chemistry undergraduate students and 7 SKS for general pedagogy courses. In addition, students have the opportunity to choose elective courses, including the "new policy of

Freedom of Learning which is called Merdeka Belajar Kampus Merdeka-MBKM". The elective courses that are offered to the students consist of 4 SKS for electives and 20 SKS for MBKM. Elective courses belong to five interest areas, which are biosciences, inorganic chemistry, physical chemistry, analytical chemistry and pedagogy in chemistry.

The general structure of the Bachelor's degree programme Chemistry Education is depicted in the following table:

No	Types of Courses	Total (In Credits)	Total (In ECTS)
1	University's Courses	14	21
2	Faculty's course	1	1,5
3	Pedagogy's courses	7	10,5
4	Study Program's Compulsory Courses	99	148,5
5	Elective Course	4	6
6	MBKM	20	30
Total		**145**	**217,5**

The peers point out, that it is not clear from the provided study plan of the Bachelor's programme Chemistry Education if the course "entrepreneurship" is a compulsory or an optional course. If it is an elective, the intended learning outcomes of the degree programme must be adjusted, because becoming an entrepreneur is part of the graduates' qualification profile: "Be able to develop and apply entrepreneurial values in relevant chemistry education fields".

The curriculum of the Master's degree Chemistry Education encompasses 19 courses and the final project (thesis). The courses are grouped into general university courses (9 SKS), courses, compulsory competence courses (36 SKS) and electives 4 SKS. A minimum of 49 SKS needs to be taken by the students. In the final year, Master's students conduct their research activities and write a thesis. In addition, students are required to submit a paper, which is based on their research results, to an international journal.

The general structure of the Master's degree programme Chemistry Education is depicted in the following table:

	Types of Courses	**Total (In Credits)**	**Total (In ECTS)**
	University's Courses	9	23.4
	Compulsory Courses	36	93.6
	Elective Course	4	10.4

Total	**49**	**127.4**

The peers notice that there are there only 4 SKS for electives in the Master's programme Chemistry Education in contrast to 8 SKS in the Master's programme Biology Education. They emphasise that the share of electives should be large enough in a Master's programme so that students have the opportunity to follow their own scientific interests. Currently, Master's students in chemistry education can select two electives out of four courses: green chemistry, applied chemistry, instrument analysis, and international journal review. For this reason, they suggest increasing the share of electives in the Master's programme Chemistry Education.

As the students explain during the audit, they spend an average of four hours per week in the laboratories. The peers point out that this amount of time is rather low by international standards. Obtaining practical hands-on experience in the laboratories is an essential part of biology and chemistry programmes and, therefore, students should spend sufficient time on conducting experiments in order to build up their chemistry- or biology-related practical skills. For this reason, the peers expect UNJ increasing the share of practical work in the Bachelor's programmes.

The peers acknowledge that courses in the educational and regular undergraduate programmes are similar because the intended learning outcomes for the basic subjects in chemistry and biology are the same. Nevertheless, there are different classes for the educational and the regular students.

The focus of the Biology undergraduate programmes is on organismic biology, which is an important Biology field in Indonesia. On the other hand, the peers are convinced that UNJ should put more emphasis on teaching modern areas of biology such as bioinformatics and molecular biology, including topics such as genetics, protein engineering, and drug design. These topics are becoming increasingly important and biology students should be familiar with them in order to be able to join international Master's programmes and start a scientific career. At the same time, chemistry students should also become better acquainted with recent developments in chemistry e.g. in areas such as sustainability, green chemistry, and ecology. In general, all students should learn more about current developments in modern areas of chemistry and biology.

The employers also suggest better training of the students in information technology skills; this would further improve their job opportunities. The peers support this point of view and suggest putting a stronger focus on digital learning and teaching methods, scientific communication, and on how to use online tools in education. These areas are becoming

more and more important in all scientific areas and all students should be able to communicate scientific concepts and ideas to pupils or the community.

The peers see that new scientific developments in biology and chemistry should be better incorporated in the degree programmes. For this reason, they suggest establishing a lecture series on current developments and inviting speakers from companies and research institutes. This optional lectures series could be offered in the evenings and give senior students insights in job perspectives and give them the opportunity to directly meeting with representatives from companies and public institutions. Since UNJ and FMIPA have good and fruitful cooperations with research institutes and companies in Indonesia, it should be easily possible to invite qualified professional experts as speakers in this lecture series.

After analysing the module descriptions and the study plans, the peers confirm that all degree programmes under review are divided into modules and that each module is a sum of coherent teaching and learning units. All practical lab work and internships are well integrated into the curriculum and the supervision by FMIPA guarantees for their respective quality in terms of relevance, content, and structure.

In summary, the peers gain the impression that the choice of modules and the structure of the curriculum ensure that the intended learning outcomes of the respective degree programme can be achieved.

International Mobility

UNJ 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 UNJ, although this transfer of credits is only possible if an agreement exists between UNJ 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..

Students' international academic mobility is supported by UNJ; for example, through scholarships such as the UNJ Global Challenge Program (since 2016), and Indonesian International Students Mobility Awards (IISMA), a scholarship programme from the Ministry of Education and Culture starting from 2021. In addition, lecturers are encouraged to carry out joint research activities with international partners and to involve students in their projects.

To promote academic mobility, UNJ has the Office of International Education Affairs (OIEA) or Kantor Urusan Internasional (KUI) to support internationalisation. This unit has the task of providing mobility services to teachers and students in order to promote various academic and non-academic activities at the international level.

A 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 UNJ (Minister of Education and Culture Regulation Number 3, Year 2020). MBKM provides opportunities for students to take a minimum of 20 SKS outside the study programme in the form of student exchange, independent projects, research activities, teaching assistant, humanitarian activities, entrepreneurship, industrial internship, or rural projects.

The peers point out that they support the idea of MBKM but it needs to be made transparent in all study plans of the undergraduate programmes – especially for the Biology programmes - what different options for MBKM exist, how many credits are awarded, and what part is compulsory and what is optional.

The peers discuss with UNJ's management if there is a strategy of UNJ or FMIPA to increase the international mobility of students and teachers. They learn that UNJ has the strategic goal to further increase internationalisation by promoting academic and research excellence, aligning the curricula to international standards, and establishing international research and teaching cooperations (e.g. with University Konstanz, Germany). The goal is to increase UNJ's international recognition and to become a reputable university in Asia.

The peers acknowledge that UNJ has established several international cooperations e.g. with universities, research institutions, or high schools e.g. in Malaysia, Taiwan, Thailand, and Japan, but so far mostly short term stays abroad are conducted. For example, students attend international summer school. The peers point out that it would also be useful to send some students for longer stays abroad, e.g. in the course of international exchange programmes. According to the opinion of the peer group, the academic mobility of the students should be further promoted. The number of students who participate in international exchange programmes is still low despite students' high interest.

The students confirm during the discussion with the peers that some opportunities for international academic mobility exist and that the credits acquired abroad are recognised at UNJ. However, they also point out that they wish for more places and better endowed scholarships for long- and short-term stays abroad. The number of available places in the exchange programmes is still limited and there are restrictions due to a lack of sufficient

financial support. UNJ can provide only limited travel grants, while the demand from students is rising. The lack of financial support hinders students from joining the outbound programmes. National scholarships are available, but they are highly competitive, so only a few students receive them.

The peers understand these problems; however, they recommend increasing the effort to further internationalising UNJ by offering more places in international exchange programmes and more scholarships. In addition, the peers see that several of the faculty members have international contacts, which can be used for establishing more international cooperations.

The peers 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. Furthermore, FMIPA should invite more visiting lecturers, initiate more international exchange programmes, and provide more scholarships for students.

A good starting point for initiating more international cooperations 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) for receiving funds for stays abroad.

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

Criterion 2.2 Work load and credits

Evidence:

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

Preliminary assessment and analysis of the peers:
Based on the National Standards for Higher Education of Indonesia (SNPT), all 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 170 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 3 to 5 hours a week of student's activities.

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

The peers point out that there can be no fixed conversion rate between SKS and ECTS points, but the ECTS points need to be calculated separately for each course. This can be easily done by dividing the students' total workload, which is described in detail in the respective module description, by the number of hours that is required for one ECTS. In addition, the module descriptions need to make transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted.

Since the programme coordinators only estimate the workload of the students, the peers expect UNJ to re-evaluate the calculation of ECTS points and asking the students about their actual workload, especially the time they need for self-studies, for each course. For example, this could be done by including a respective question in the course questionnaires. By correctly displaying students' workload in ECTS credits, UNJ would facilitate academic mobility and better support their graduates if they apply for international programmes.

In any case, UNJ needs to verify the students' total workload and make sure that the actual workload and the awarded ECTS points correspond with each other. This is especially relevant for the Bachelor's and Master's thesis, because here, the share of students' self-study time is particularly high. The information about the students' total workload and the awarded ECTS points should be made transparent in the module descriptions and the study plans.

Several of the students in the educational undergraduate programmes take longer than the targeted four years to finish the degree programme. As described in the Self-Assessment Report, the average study period for the regular biology and the chemistry programmes is 4.2 years (chemistry) and 4.6 years (biology). On the other hand, undergraduate students in the educational programmes need an average of 5.5 years (biology and chemistry) to

finish their degree programme. The peers see that the degree programmes consist of several small modules/courses. This way, students gain a broad overview over their respective subject, however they cannot go deep into scientific details. Since in educational programmes also pedagogical skills are trained the students workload is quite high and affords more time. To focus on the most relevant fields of biology and chemistry at least in the educational programmes may be a solution for reducing the average study time. FMIPA should analyse this situation and find out for what reasons undergraduate students in the educational programmes study significantly longer than undergraduate students in the regular programmes. After analysing the situation, appropriate measure should be taken in order to solve the identified problems.

The dropout rate in the Bachelor's degree programmes as well as in the Master's programmes is rather low. On average, only around two students drop out each programme per year. The main reasons why students withdraw is that they transfer to a different academic programme, either at UNJ or at another university.

In summary, the peers confirm that all programmes under review have a high but manageable workload. Students can give their feedback on the courses and comment if they think that the workload is too high. However, 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.

Criterion 2.3 Teaching methodology

Evidence:

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

Preliminary assessment and analysis of the peers:

The learning method applied in the Biology and Chemistry programmes is a combination of teacher-centred learning (TCL) such as classroom teaching/tutorials, demonstrations, and laboratory sessions, and student-centred learning (SCL) such as group discussions, case studies, cooperative and project-based learning, field studies, and laboratory work. Each course can use one or a combination of several teaching and learning methods.

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 (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.

Learning activities are carried out on-site and online. On-site learning is conducted face-to-face in classrooms, laboratories, or during field trips. Assignments are submitted directly to the lecturer during a face-to-face meeting or via e-mail, Microsoft Teams, and other learning media systems. Online learning was applied intensively during the COVID pandemic. It is carried out through the online learning system (SIAKAD), an online learning portal within UNJ. Online learning also uses various media such as Microsoft Teams or Zoom. Restrictions on practical activities during the pandemic have constrained the laboratory work. In response to this situation, simulations were performed in the laboratory and the video demonstration was then discussed online with the students. In addition to demonstrations, several experimental learning videos from various websites were presented.

Neither the Biology nor the Chemistry programmes have international classes. However, lectures in English are also conducted by inviting guest lecturers/professors from overseas who deliver courses either in person or online. In addition, English is usually used in lecture materials (PowerPoint slides) and references in most courses.

In summary, the peer group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concepts of all programmes comprise a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning). However, undergraduate students need to get more hands-on experience with practical laboratory techniques and instruments, the share of practical laboratory work should be increased (see criterion 2.1).

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports

- UNJ Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the peers:
UNJ 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 undergraduate 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. Students should meet with their academic advisors at least three times per semester. If students do not contact their academic advisor, they will remind students and invite them for a meeting. Students confirm during the discussion with the peers 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 have one or more supervisors, who are selected based on the topic of the final project. One supervisor could be an external supervisor, if the student performs the final project outside UNJ. The role of the final project supervisor is to guide students in accomplishing their final project, e.g., to finish their research and complete their final project report.

All students at UNJ have access to the digital academic information system (SIAKAD). The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via SIAKAD.

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

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

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

The peers confirm that the Laboratory Management Course, has been added to the first semester of the Bachelor's degree programme Biology Education. In addition, they now understand that the course "entrepreneurship" is a compulsory in the Bachelor's programme Chemistry Education. The peers point out that UNJ put more emphasis on designing the documents in order to avoid inconstancies.

The peers stress that according to the Self-Assessment Report and the study plan, there are only 4 SKS for electives in the Master's programme Chemistry Education. However, there are four different courses (with 8 SKS) from which the students can chose their electives.

The peers understand how UNJ calculates the students' workload. Nevertheless, they expect that UNJ increases the share of practical work in the Bachelor's programmes. It is important to involve students in research activities and to put more emphasis on practical laboratory work in the different scientific fields (e.g. microbiology, plant biotechnology, animal research, plant physiology, and molecular biology).

As UNJ explains in its statement, Molecular Biology is a compulsory course and Bioinformatics an elective course in the undergraduate Biology programmes. The peers support the plan of converting Bioinformatics from an elective to a compulsory course. UNJ should also think about making the courses in Genetics and Protein Engineering compulsory in order to better prepare the graduates in modern areas of biology.

UNJ should take the employers suggestion of better training of the students in information technology skills serious. However, it is not necessary to offer more separate courses in this area but it also possible to integrate IT-skills in already existing courses.

If students' in the educational programmes take longer to finish their degree because it is difficult to combine teaching practise in schools with attending classes, UNJ should rearrange the practical courses and offer them e.g. in bloc system.

The peers consider criterion 2 to be mostly fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- Module descriptions
- UNJ Academic Guidelines

Preliminary assessment and analysis of the peers:

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 form of each exam is mentioned in the module descriptions that are available to the students via UNJ's homepage and the digital platform SIAKAD. 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.

The grading system is different for the internship, the community service, and the final project. The details, which assessment forms are used in these courses and how they contribute to the final grade, are described in the respective module descriptions and the course contract.

The most common type of evaluation used are written examinations; however, quizzes, laboratory work, assignments (small projects, reports, etc.), presentations, seminars, and discussions may contribute to the final grade. Written examinations, either closed-book or open-book, typically include short answers, essays, problem-solving or case-based questions, and calculation problems. Some lecturers also give multiple choice or true-false questions in examinations or quizzes. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams.

Teachers have the flexibility to determine the contribution of the different assignments and exams to the final grade. For example, in chemistry courses, the proportion of assignments is 30 %, of the mid-semester is 30 %, and of the final exam 40 %. Other courses can assign different shares for each exam. Students are informed about mid-term and final exams via the Academic Calendar. Students can access their results via UNJ's digital platform SIAKAD.

The course "Research Methodology", which is offered in the fourth semester of the undergraduate programmes, is designed to introduce students to scientific methods and re-

search activities. Students conduct research activities in the laboratories under the guidance of a supervisor, including proposal preparation, implementation of laboratory research, and report preparation. In addition, the study programmes provide briefings on scientific writing materials and latest research materials. Moreover, when a thesis supervisor has been appointed, students can further discuss their research proposals with the supervisor.

If a student fails a course (minimum passing grade for each course is “C” for the Bachelor’s programmes and “B” for the Master’s programmes), she or he usually has to repeat the entire module in the following semester; it is usually not possible to retake just parts of the course or to just retake the final exam. However, mid-term exams can be repeated (remedy) but if a student fails the final exam, she or he has to retake the whole course in the next semester. The absence of students in the midterms and finals due to illness or otherwise is remediable by taking the exam later. Students, who cannot attend practical courses for acceptable reasons, can repeat the practicum later; the lecturers are responsible for the arrangement. Students with special needs are provided with support to enable them to participate in the academic activities and exams. There is a fixed period after the announcement of the final grades, during which students can ask for explanations and can appeal their grades.

Every student in the Biology and Chemistry programmes is required to do a final project (Bachelor’s or Master’s thesis). This project is conducted independently under the guidance of one or more supervisors and usually consists of literature study, practical research, data analysis, presentations in figures or tables, and writing the thesis. Both the student and his /her supervisors might decide the topic and content of the project. In most cases, the lecturers offer particular topics connected to their research. When designing their final projects Master’s students consult with their academic advisor who recommend teachers, which are experts in the chosen field. Master’s students can design their own research projects with the help, advice, and direction of the advisor.

The students have to present their results and defend them in an oral presentation in front of a team of two experts and a supervisor. The thesis seminar includes a written thesis, seminar presentation, and discussion where students must defend their work before the examiners. The passing grade of the thesis examination is “B” for undergraduate and Master's programmes. If the passing grade is below a grade of “B”, the student has the opportunity of a re-examination.

With respect to the exams, the peers are convinced that it would be useful to put more emphasis on questions related to transfer skills and critical thinking. The mid-term and final exams should not only verify if the students have learned the content by heart but if they

understand the context and the reasoning behind it and are able to apply the acquired knowledge to new areas. In general, the examinations focus on learning by heart and too little on the ability to solve problems by self-determined application of what has been learnt. This easily can be improved but it requires more effort and open minded thinking from the teachers to design such exams and handle/accept even "unusual" solutions given by the students. The students should be motivated to think free and to be brave to present own results which cannot be found directly in a textbook. The peers point out that this is especially relevant for mid-term and final exams. Students should be trained in critical and analytical thinking and not only learn facts by heart; this should be reflected in the written exams. In addition, the share of exam questions dealing with transfer skills should be increased in the course of the degree programmes and should be highest in the latest semesters.

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

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

The peers appreciate that UNJ sees the need to prepare the students to become critical thinkers and problem solvers. However, this should be reflected also in the written exams, especially the mid-term and final exams. Here, the peers still see a deficit, as the exams mainly focus on repeating learned knowledge and facts.

The peers consider criterion 3 to be mostly fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

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

Preliminary assessment and analysis of the peers:

At UNJ, the staff members have different academic positions. There are professors, associate professors, assistant professors, and lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, 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.

According to the Self-Assessment Report, the Faculty of Mathematics and Natural Science (FMIPA) has a staff of 126 teachers and 47 supportive staff members (laboratory and administration staff). FMIPA offers 10 Bachelor's and 4 Master's degree programmes. Currently, there are 2140 students at FMIPA, which results in student to teacher ratio of 1:18.

With respect to the teachers' academic position, UNJ provides the following table:

Staff	Chemistry Cluster	Biology Cluster
Professors	4	1
Associate Professors	6	8
Assistant Professors	10	13
Lecturers	5	12
Total	25	34

All teachers are assigned to their "home base", meaning the study programme where they are involved most. However, all teachers give classes in relevant subjects. For example, chemistry teachers give classes in the Bachelor's degree programme Chemistry, the Bachelor's degree programme Chemistry Education, and the Master's degree programme Chemistry Education.

The teacher to student ratio for the six programmes is depicted in the following table:

	Ba Chemistry	Ba Chemistry Education	Ma Chemistry Education	Ba Biology	Ba Biology Education	Ma Biology Education
Teachers	18	25	13	16	23	11

Students	255	394	44	167	405	52
Ratio	**1:14**	**1:15**	**1:3**	**1:10**	**1:17**	**1:5**

The teaching staff in the Bachelor' degree programme Biology consists of 16 teachers, while there are 167 students. The teacher to student ratio is 1:10.

There are 23 teachers and 405 students in the Bachelor' degree programme Biology Education. This results in a teacher to student ratio of 1:17.

There are 11 teachers and 52 students in the Master' degree programme Biology Education. The ratio of lecturers and students is 1:5. All teachers that give classes in a Master's degree programme need to hold a PhD degree.

There are 18 teachers and 255 students in the Bachelor's degree programme Chemistry. The ratio of teachers to students is 1:14.

The Bachelor's degree programme Chemistry Education has 25 teachers and 394 students. The teacher to student ratio is 1:15.

There are 13 teachers and 44 students in the Master' degree programme Chemistry Education. The ratio of lecturers and students is 1:3. All teachers that give classes in a Master's degree programme need to hold a PhD degree.

The details about the teachers' academic qualification (PhD or Master's degree is detailed in the following table:

	Ba Chemistry	**Ba Chemistry Education**	**Ma Chemistry Education**	**Ba Biology**	**Ba Biology Education**	**Ma Biology Education**
PhD	**13**	**18**	**13**	**8**	**11**	**11**
Magister	**5**	**7**	**0**	**8**	**12**	**0**
Total	**18**	**25**	**13**	**16**	**23**	**11**

Further details of the academic qualifications of the teachers are described in the staff handbooks, which are accessible via the respective department'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 peers learn that the official working hours for university teachers is 39.5 hours per week. 27.5 hours for teaching and other teaching activities, 10 hours for research, 1 hour for community service and 1 hour for other activities. The teachers confirm that their workload is adequate and that they have enough time for fulfilling all their tasks.

The peers discuss with UNJ's management how new staff members are recruited. They learn that every year the faculties and departments announce their vacancies to UNJ's management, which subsequently announces the vacancies on UNJ's webpage. One way to recruit new teachers is to send promising Master's students from UNJ abroad to complete their PhD and then to hire them as teachers when they are finished. Nevertheless, UNJ also hires graduates from other universities. Vacancies are announced nationally, so UNJ gets applications from other universities. The new policy at UNJ is to hire only new teachers with a PhD degree.

UNJ and FMIPA have a sufficient number of teachers with proper qualifications and competences. However, during audit discussions it was apparent that the teachers' English communication skills should be further improved, e.g. by exposure to more international colleagues.

In summary, the peers 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 programmes.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Staff Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

UNJ 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 (ICT), laboratory safety and instrumentation, writing publications, and e-learning. The peers point out that it would be very useful to periodically evaluate the improvement

of the teachers' English skills. Furthermore, Applied Approach (PEKERTI-AA) 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 UNJ 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, UNJ provides foreign language training and organises seminars presenting scholarships from various sources.

During the audit, the peers inquire if the teaching staff has the opportunity to spend time abroad and to participate in international projects. They learn that UNJ and FMIPA provide funds for joining international conferences. Moreover, teachers have the opportunity to receive funding from the Ministry of Research, Technology and Higher Education. The funding covers conference and publication fees, and expenses for accommodation and traveling. The teachers are satisfied with the existing opportunities and the available financial support.

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at UNJ, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars; even a sabbatical leave is possible. However, the peers notice that semester long leaves in the course of a sabbatical are hardly ever conducted. For this reason, the suggest giving the teachers more opportunities for a semester long sabbatical leave so that they can better follow their research activities, or/and go abroad.

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

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report

- Video of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the peers:
Basic funding of the undergraduate programmes and the facilities is provided by UNJ and FMIPA. The financial sources are government funding, tuition fees from students, community and industry funding. Additional funds for research activities can be provided by UNJ or the Indonesian government (Bantuan Pendanaan Perguruan Tinggi Nasional, BPPTN), but the teachers have to apply for them.

As UNJ's management explains during the audit, approximately 40 % of UNJ's total budget is provided by the Indonesian government and is mostly used for salaries. The rest of the financial funds comes mostly from tuition fees, business units, and cooperations with companies. Budget planning for the chemistry and biology programmes is specified by a planning and development team, which prepares a yearly budget plan. Allocation planning and financial management for the programmes are carried out jointly between the study programmes, FMIPA, and UNJ.

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

The peers notice from the detailed information provided in the Self-Assessment Report about the financial funds for each degree programme that the Master's programme Chemistry Education had a decrease in financial funds by 50 % from 2020 to 2021. UNJ's management explains that this decrease is mostly caused by a significant drop in acquired research funds by the teachers in the Master's programme Chemistry Education. The peers do not think that this is a positive development and that this issue this should be resolved as soon as possible. Especially in a Master's programme, it is important to conduct sufficient research activities and teachers should be encouraged to increase their efforts in this respect.

The Faculty of Mathematics and Natural Sciences has several rooms, which are used for learning and teaching activities. The FMIPA building has classrooms, lecturer rooms, administration rooms, discussion rooms for lecturers, meeting rooms, and laboratories.

FMIPA has 34 laboratories for practical courses and research activities. Teaching activities in the laboratories (practicum) are conducted according to a predetermined schedule. In addition, the laboratories are also used for students' and teachers' research activities.

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

From the provided documents and videos of the laboratories, the peers deduct that there seem to be no severe bottlenecks due to missing equipment or a lacking infrastructure. The basic technical equipment for teaching the students is available, although it is not state of the art and in some important areas such as instruments for cellular and molecular biology and analytical chemistry are clearly not sufficient and not up to international standards. Here, improvements of the technical equipment are necessary. The students confirm during the discussion with the peers that, in general, they are satisfied with the available equipment, but several instruments are outdated. Moreover, the peers learn during the audit that students can use and operate the instruments in the laboratories by themselves after being trained and instructed by either senior students or lab technicians. Each laboratory has a lab supervisor; in addition, there are several senior students, who work as lab assistants. A noticeable advantage is the opportunity that the student can conduct lab courses in external institutes such as the State Forensic Lab. This reduces the costs to buy and run equipment at UNJ and the learning outcomes can even be better achieved, because students can directly deal with “real life” problems and get in contact with external institutes, which is helpful for finding research and thesis projects. There should be agreements between UNJ and the external institutes, which describe the content and extend of their contribution to teaching.

Nevertheless, it is difficult for the peers to assess the extent of the safety measures based on the videos and the discussions alone. Only some laboratories are shown in the videos and especially the scope and design of the safety standards remain unclear (material and surface quality of the working benches, safety goggles, gloves, eye showers, fire extinguishers, emergency exits, chemical-proof cabinets, first-aid kits, fume hoods, waste management, and ventilation system). In the videos, students work without protecting glasses – which is not acceptable. Students wear gloves when they use a computer keyboard. If these gloves are contaminated the next user without gloves will get in contact with those hazards. In one video, students use a glass flask equipped with a “Liebig” cooler, most probably to conduct an organic reaction with reflux cooling. “Liebig” coolers usually will not be used for such purpose hence the cooling effect may not be sufficient in detail for solvents with low boiling points. Additionally, the cooling water flows in the wrong direction. If a student of UNJ wants to study abroad, the supervisor of the receiving partner university who watches this video will be skeptical to employ the student in his laboratory.

For this reason, the peers point out that it is necessary to verify that the safety measures are strictly followed in the labs by all persons and to explain in detail, what safety measures are in place. The peers understand that students receive safety instructions at the beginning of every laboratory class, but it is also necessary that all persons follow these instructions.

During the audit, the peers learn that UNJ is currently planning to construct new buildings; the funding comes from Saudi Arabia. FMIPA should do a professional planning of the laboratories and should follow international laboratory safety standards while designing the laboratories. Form the peers' point of view, this is a great chance to design and install modern laboratories, which are aligned with international safety standards.

The peer group understands that modern research equipment for sophisticated laboratory work, sufficient in terms of quality and quantity, is not readily available and that the funds are restricted. This is partly compensated by the fact that in addition to the laboratories in the different departments, UNJ cooperates with research institutes and other universities in order to give teachers access to more sophisticated instruments. For example, institutions such as the criminal laboratory of the Indonesian National Police, which has very complete analytical tools, as well as the Oil and Gas Institute (LEMIGAS) cooperate with UNJ.

The students also express their satisfaction with the library and the available literature there. Remote access via VPN is possible and UNJ offers access to several scientific digital databases such as ScienceDirect and Scopus, so that teachers and students access current scientific papers, e-books, and papers.

In summary, the peer 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 programmes.

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

The peers acknowledge that UNJ offers language classes for staff members once a week and encourages them to take part at international conferences and seminars. However, the peers agree that the effort should be increased and that there is room for improvement with respect to teachers' English proficiency.

The peers thank UNJ for clarifying that some research funding in the Master's degree programme Chemistry Education was not included in the provided documents and that the decrease in financial funds from 2020 to 2021 amounts to 40 %.

The peers confirm that UNJ has signed collaboration agreements with its external partner that include information about the content and extend of the partners' contribution to teaching.

With respect to the safety measures, it is important that the laboratories are sufficiently equipped with fume hoods, reflux condenser, clean benches, air management system, autoclaves, etc.. Here is still room for improvement.

The peers consider criterion 4 to be mostly fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Webpage Ba Biology: https://fmipa.unj.ac.id/biologi/en/
- Webpage Ba Biology Education: https://fmipa.unj.ac.id/pbiologi/
- Webpage Ma Biology Education: https://fmipa.unj.ac.id/s2biologi/en/
- Webpage Ba Chemistry: https://fmipa.unj.ac.id/kimia/?lang=en
- Webpage Ba Chemistry Education: https://fmipa.unj.ac.id/pkimia/
- Webpage Ma Chemistry Education: https://fmipa.unj.ac.id/s2pendkimia/en/

Preliminary assessment and analysis of the peers:

After studying the module descriptions of all three Biology programmes, the peers point out that they do not include all necessary information. Especially the information about the person(s) responsible for each module, the teaching methods, the students' work load, the awarded credit points (SKS and ECTS), the intended learning outcomes, the content, the applicability, the admission and examination requirements, and the literature references are either missing or are incomplete.

In addition, the module descriptions should make clear what course is a lecture and what course includes laboratory work. The module descriptions also need to specify how many hours students spend in the laboratory in each course and what laboratory work is done.

For this reason, the peers expect an update of the module descriptions for the Biology programmes that should include all necessary information.

The peers also point out that the information about the teaching format in the module descriptions of all programmes under review should be updated; it is not always clear what course is a lecture and what course includes laboratory work. The module descriptions need to make transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted. For example, in the chemistry courses, what syntheses are done. In addition, the calculation of the students' total workload and the conversion into credits is either missing or not transparent. The students total workload (time spend in the classroom and laboratory and the time needed for self-studies) needs to be described in detail, this is especially relevant for the theses. This issue is also discussed under criterion 2.2.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Diploma
- Sample Diploma Supplement

Preliminary assessment and analysis of the peers:
The peers confirm that the students of all programmes under review are awarded a Diploma Certificate and a Diploma Supplement after graduation. The provided sample Diploma Supplement for the Bachelor's degree programme Chemistry Education contains almost all required information about the degree programme. However, it would be useful to include the PLO. In addition, UNJ should provide sample Diploma Supplements for the other degree programmes.

Criterion 5.3 Relevant rules

Evidence:

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

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both UNJ 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 programmes (e.g., module handbook, study plan, profile) is available on the English homepage of the programmes.

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

Together with its statement, UNJ provides sample Diploma Supplements for all sic degree programmes. The sample Diploma Supplements include all necessary information about the respective degree programme.

UNJ has submitted some updated module description that now include information about the conducted experiments and the students' workload. However, the peers expect that all module descriptions are updated accordingly and expects UNJ to submit the complete module handbooks in the further course of the procedure.

The peers consider criterion 5 to be mostly fulfilled.

6. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- UNJ Policy of Quality Assurance
- Discussions during the audit

Preliminary assessment and analysis of the peers:
Quality assurance at Universitas Negeri Jakarta consists of the Quality Assurance Unit (Satuan Penjaminan Mutu, SPM) at university level, the Gugus Penjaminan Mutu (GPjM), at faculty level, and Tim Penjaminan Mutu (TPjM) at programme level.

The peers discuss the quality management system at UNJ with the programme coordinators. The peers learn that there is an institutional system of quality management aiming at continuously improving the degree programmes.

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 UNJ. 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 degree programmes under review have received the either accreditation status “A” or “B” from BAN-PT.

FMIPA implements the internal quality assurance system through the Implementation Disposal of Improvement Control Evaluation (PPEPP) model, which consists of five steps: setting the system, applying the system, evaluating the system, giving recommendations, and improving the system. The PPEPP results are reported to the Dean, the programme coordinators, students, and external stakeholders. The Dean will then determine the steps or policy to improve the academic quality based on the report.

Internal assessment of the quality of the degree programmes 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. Students’ opinion is quantified by means of index 1 (unsatisfactory) to 4 (excellent). Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on the digital platform SIAKAD. The peers 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 2.2).

The peers acknowledge that UNJ has established a comprehensive quality assurance system that is generally suitable to identify weaknesses and to improve the degree programmes. The Department Head can access the students’ feedback and responses to each course via SIAKAD. Each teacher and student can see the average score of the students’ feedback from their account in SIAKAD.

The auditors gain the impression that the departments take the students’ feedback seriously and changes are made if necessary. In case of negative feedback, the Head of Department talks to the respective teacher, analyses the problem, and offers guidance. There are regular meetings (open dialog) with students where they can voice their issues and suggestions. During these meetings, students’ representatives can raise any topics they want to discuss. However, it would be useful if the teachers would also discuss directly with the

students about any problems, what could be improved in the respective course and especially about the results of the course questionnaires.

In addition, FMIPA regularly conducts an alumni tracer study. By taking part at this survey, alumni can comment on their educational experiences at UNJ, the waiting period for employment after graduation, their professional career and can give suggestions how to improve the programme. The results of the latest alumni tracer study show that 83 % of the alumni are employed, 8 % are studying, and 9 % are unemployed. In addition, 80 % of the graduates get jobs within less than six months after graduation.

During the audit, the peers learn that students are not represented in the university's boards. Thus, students are not directly involved in the decision-making processes. The peers are convinced that it would be very useful to have student members in the different boards (e.g. GPjM and TPjM). For this reason, they recommend that student representatives should be members of the boards at UNJ at least on department and programme level and be actively involved in the decision-making processes for further developing the degree programmes.

The peers discuss with the representatives of UNJ's partners from public institutions, and private companies if there are regular meetings with the partners on faculty or department level, where they discuss the needs and requirements of the employers and possible changes to the degree programmes. They learn that there is an advisory board at FMIPA, which consist of alumni and representatives from companies, schools, research centres, universities, students' boards, and professional associations. The advisory board provides feedback and suggestions that contributes to further developing the curricula and to improving the teaching and learning activities. The peers appreciate that UNJ stays in contact with its alumni and has a close relation with its partners from the industry, schools, and public institutions.

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

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

UNJ does not comment on this criterion in its statement.

The peers consider criterion 6 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 the Higher Education Institution on the previous chapters of this report:

- Sample Diploma Supplements for all degree programmes

E Comment of the Higher Education Institution (19.08.2022)

UNJ provides the following statement:

Criteria	Statement	Response
1.1	(Graduates of the Bachelor's degree programme) They learn to work in a team and to carry out practical work in a laboratory and in the field. In addition, graduates should be able to work scientifically and be familiar with technological innovations and the use and preservation of biological resources. **(pp.11, paragraph 2).**	The Biology Bachelor's degree program curriculum states that students should take 144 sks (216 ECTS). The workload for practical work in the laboratory and the field are categorized as: 1. **18 sks (27 ECTS**) for practical work (compulsory course) 2. **37 sks (55.5 ECTS**) for Biology course (elective course), However, most elective courses in the module description have practical work to improve their laboratory or field skills. 3. **3 sks** (**4.5 ECTS**) for **Internship**, the student should attend 8 hours a day for three months depending on research institution regulation. Most institutions train our students to be involved in research with the latest instruments and technological innovations. According to the Ministry of Education regulation, 1 (one) sks (**1.5 ECTS**) takes **170 minutes (approx. 3 hours in are working laboratory**). In addition, the students need 60 minutes for preparation before and after practice. https://bit.ly/PermenNo3Tahun2020 Preservation of biological resource skills is already conducted in several compulsory courses, e.g., in Biodiversity of Fungi and Biosystematics of yeast. Therefore, the student should collect some microorganisms they found in the field work, then be isolated and organise them in UNJ Culture Collection (UNJCC). https://www.acm-mrc.asia/M/unjcc.html. https://fmipa.unj.ac.id/biologi/en/research-laboratory/microbiology-laboratory-and-microbial-collection-culture/ In Plant Biotechnology, the student practices encapsulating explants from aseptic material to preserve plant genetic material. https://bit.ly/ResearchLabBioUNJ-PlantTissueCulture-InVitroCollection

Criteria	Statement	Response
		In Animal Research, the student should breed the mice to maintain the number of mice for the subsequent study. Evidence of students' undergraduate thesis in Biology Study Program based on the UNJ Research Master Plan (RMP) in the Scope of Science and Technology. https://fmipa.unj.ac.id/biologi/en/research/ Proof of PCR utilization, fieldwork and field laboratory can be accessed at https://bit.ly/ResearchLabBioUNJ-PlantPhysiology-MolecularBiol https://bit.ly/ResearchLabBioUNJ-Biodiversity-Ecol
1.1	The goal of the Master's degree programme Biology Education is to impart the necessary professional skills (pedagogic, personal, and social) in biology, which are needed to become a successful teacher, education manager, or researcher. To this end, graduates should master advanced theoretical principles in biology and be able to plan and conduct advanced biological experiments. In addition, they should understand the field of biology education in theory and practice, to develop and apply biology teaching techniques and methods, and to analyse education management policies and curricula. Finally, they should be able to design and carry out complex research activities in the area of biology education, and be able to take over leadership functions in the education sector. **(pp. 12 paragraph 2)**	To achieve competence as a biology teacher, the student must implement biology teaching methods and techniques that are supported by biology learning design courses, biology learning media and biology learning evaluation. In addition, the ability to conduct experiments is prepared through genetics and molecular biology courses. Meanwhile, managerial and leadership competencies are provided through school-based management courses and soft skills development in each subject.
1.1	To this end, graduates should master advanced theoretical principles in chemistry and be able to plan and	The Master of Chemistry Education Study Program curriculum is designed to prepare graduates as professional educators, education managers, and educational researchers.

Criteria	Statement	Response
	conduct advanced chemical experiments. In addition, they should understand the field of chemistry education in theory and practice, to develop and apply chemistry teaching techniques and methods, and to analyse education management policies and curricula. Finally, they should be able to design and carry out complex research activities in the area of chemistry education, and consequently take over leadership functions in the education sector **(pp.12, paragraph 2).**	Thus, all students should take compulsory courses and elective courses offered for them to be able to compete in the world of work. To become professional educators and researchers, students should master pedagogical practices and basic chemical concepts. Students should also understand the field of chemistry education, both in theory and practice, develop and apply chemistry teaching techniques and methods, analyze policies, and manage educational curricula. In addition, students should be able to design and carry out research activities responsibly concerning ethics. To become educator managers, students should be competent leaders in determining policies in the education sector. Finally, to become educational researchers, students should be qualified to master basic and advanced theoretical principles in chemistry and design chemical experiments in basic and advanced studies.
1.1	They also should be familiar with modern experimental methods of chemistry, the safe handling of chemicals, have a sound knowledge of safety and environmental issues and the underlying legal framework, and be able to interpret, critically assess, present and communicate relevant information and new research results, and to discuss them with specialist colleagues. **(pp. 12, paragraph 4)**	The Study Program facilitates Health, Safe, and environment (HSE) programs through courses in Health, Security, and Environment in the Chemistry laboratory. There is also regular HSE training every semester in the laboratory before students carry out practicum and research in the chemistry laboratory. HSE training is facilitated by the lecturer who has a certificate of competence in occupational, Health and Safety in the laboratory from the Indonesian Professional Certification Authority. Chemical management, especially regarding waste management in chemical and biological laboratories, has been carried out in collaboration with PT PPLI (http://ppli.co.id/). The chemistry Study Program develops a curriculum that allows students to explore more about modern chemistry methods through Bioscience, Material Science, and Material Characterization methods and all the elective subjects. In addition, industry practitioners give lectures in 6 of 16 meetings in one semester, such as the Industrial Chemistry course. The student also has experience with hands-on chemical instruments through the internship program. In addition to our students have opportunities to access advanced instrument with collaboration with other national research institution which located near campus.

Criteria	Statement	Response
1.3	The Master's degree programmes Biology Education and Chemistry Education are also full time study programmes, which are designed for two years and encompass 44 SKS (114,4 ECTS points) for Biology Education and 49 SKS (127,4 ECTS points) for Chemistry Education **(pp. 15, paragraph 2) (also in pp.2 and pp.25)**	Correction for Master's Degree programmes Biology Education = 46 SKS (119,6 ECTS)
1.3	During the discussion, the UNJ explains that students' "creativity" during the internship is one of the assessed criteria. The peers do not quite agree with this assessment criterion, because it is very subjective. According to the information provided during the discussions, some students conduct the internship at international school, which means they must teach using an international curriculum (such as IGCSE, A-Level, or IB). Therefore, it would be useful to introduce the students to international curricula and the respective teaching strategies during the educational courses. UNJ has established co-operation agreements with several schools for conducting their teaching internship there. Moreover, students can conduct the community service in schools all around Indonesia and students can also go for their teaching internship. **(pp. 17, paragraph 1)**	The assessment of the creative process carried out by students during the internship is based on the CREATIVE BEHAVIOR OBSERVATION assessment rubric. Study Programs have provided teaching practicum experiences at the international level and included the international curricula topics in the subject of curricula. In addition, students conduct summer school activities. https://bit.ly/3QKECNe (Creativity)
1.3	In addition, the undergraduate programme should also put more English courses into their curricula. This would further improve the students' English proficiency and bet-	To improve the student's English proficiency, several programs are provided, such as English course, English club, English textbooks and international journals for tasks, projects and thesis references, writing manuscripts in English,

Criteria	Statement	Response
	ter prepare them for the job market. In the discussion with the peers, students and alumni support this point of view. **(pp. 17, paragraph 2)**	speaker/presenter in international seminars/conferences, summer school participating.
1.4	Applicants need to have a Bachelor's degree in the respective subject (chemistry or biology) but they do not need to have an educational background but can also have a degree in "pure" chemistry or biology. If they do not have any educational or teaching experience, Master's students have to attend an educational course in the Master's programme. However, the peers think that it would be useful to require students with a pure science background to attend more pedagogical courses. **(pp. 22, paragraph 1)**	The matriculation program for students with a biological background (not biology education) is provided to meet the adequacy of pedagogical aspects.
1.4	The peers notice that just one teacher each currently conducts the 30 minutes long interviews. They point out that it would be more appropriate to have at least two interviewers for each applicant. This way, the out-come of the interview will be impartial. In addition, UNJ should provide a guideline for conducting the interview with the criteria, interview topics, and a score sheet. **(pp. 22, paragraph 2)**	In the current selections, we start to involve two interviewers in the interview process to obtain a more objective decision for student enrollment submission. https://penmaba.unj.ac.id http://103.8.12.212:37580/seleksi-pascasarjana/login.php
2.1	As the qualification profile of the Bachelor's degree programme Biology Education includes biology laboratory manager, the curriculum should also focus on courses related to laboratory management. During the discussions, UNJ states	In the distribution of existing courses, the Laboratory Management Course, has been added and placed in semester 1. https://bit.ly/CurriculumMappingofBaBiologyEducation

Criteria	Statement	Response
	that they offer a course to this respect in the first semester, but the provided curriculum shows otherwise. **(pp. 25, paragraph 1)**	
2.1	The peers point out, that it is not clear from the provided study plan of the Bachelor's programme Chemistry Education if the course "entrepreneurship" is a compulsory or an optional course. If it is an elective, the intended learning outcomes of the degree programme must be adjusted, because becoming an entrepreneur is part of the graduates' qualification profile: "Be able to develop and apply entrepreneurial values in relevant chemistry education fields". **(pp. 26, paragraph 2)**	Entrepreneurship is the compulsory courses in the curricula to support the graduate profile. The study program provided the revision curriculum before visitation and after visitation. We resent the curriculum document Entrepreneurship activities has been involved in student extracurricular program in study program, university program, and MBKM program to support graduate profile https://bit.ly/CurriculumOverviewofBaChemistryEducation https://bit.ly/3QBoL3G (curriculum overview)
2.1	The peers notice that there are there only 4 SKS for electives in the Master's programme Chemistry Education in contrast to 6 SKS in the Master's programme Biology Education **(pp. 27, paragraph 2)**	In the chemistry education master's program, there are eight credits of elective courses, namely Course of Instrument Chemistry (2 credits), Green Chemistry (2 credits), International Journal Studies (2 credits) and Applied Chemistry (2 credits). https://bit.ly/3QBoL3G (curriculum overview)
2.1	Obtaining practical hands-on experience in the laboratories is an essential part of biology and chemistry programmes and, therefore, students should spend sufficient time on conducting experiments in order to build up their chemistry- or biology-related practical skills. For this reason, the peers expect UNJ increasing the share of practical work in the Bachelor's programmes. **(pp. 27, paragraph 4)**	The credits of laboratory experiments have been explained in additional documents of laboratory experiments in module descriptions after the visitation. According to the Ministry of Education regulation, 1 (one) sks (1.5 ECTS) takes 170 minutes (approx. 3 hours in are working laboratory). In addition, the students need 60 minutes for preparation before and after practice. We follow the ministry regulations, and the practicum course composition has been calculated. In Curricula, practicum credits as compusory course range 15-19 SKS (22,5-28,5 ECTSS), such Practicum in: a. Biology: 18 SKS (27 ECTS) b. Biology Education: 15 SKS (22,5 ECTS) c. Chemistry:19 SKS (28,5) d. Chemistry Education: 19 SKS (28,5 ECTS)

Criteria	Statement	Response
		In addition, Chemistry and Biology study program have more laboratory activities during final thesis project. Below is attached description of practicum in module description. https://bit.ly/ModuleDescriptionofPracticum
2.1	The focus of the Biology undergraduate programmes is on organismic biology, which is an important Biology field in Indonesia. On the other hand, the peers are convinced that UNJ should put more emphasis on teaching modern areas of biology such as bioinformatics and molecular biology, including topics such as genetics, protein engineering, and drug design. These topics are becoming increasingly important and biology students should be familiar with them in order to be able to join international Master's programmes and start a scientific career. At the same time, chemistry students should also become better acquainted with recent developments in chemistry e.g. in areas such as sustainability, green chemistry, and ecology. In general, all students should learn more about current developments in modern areas of chemistry and biology. **(pp. 28, paragraph 2)**	According to the Biology curriculum (Table conversion Curriculum 2013 – 2017). Biology Molecular (4.5 ECTS / semester 5th) is a compulsory course, and Bioinformatic (3.0 ECTS/ semester 7th) is an elective course that has been taught since 2017. It is possible to convert Bioinformatic from an elective to a compulsory system in our next curriculum revision to increase our student's knowledge of modern biology. The topic of genetics has existed in our curriculum since 2019, and we already have elective courses related to genetics, such as genetic population and conservation. The topic of protein engineering is adopted during the proteomic course. In addition, an elective course such as basic plant genetic engineering or toxicology will be developed as suggested. The development of the curriculum from 2013 to 2021 is described on our website: https://fmipa.unj.ac.id/biologi/kurikulum-snpt-2013-dan-snpt-2017 https://fmipa.unj.ac.id/biologi/kurikulum-snpt-2017-dan-snpt-2021 https://bit.ly/BioUNJ_curriculumSNPT_2013-2017 https://bit.ly/BioUNJ_curriculumSNPT_2017-2021 Biology Curriculum's subject matter is developed based on the Indonesian Biology Consortium (KOBI). The subject matters are Biology Cell and Molecular, Physiology, Genetic, Structure and Development, Biosystematics and Evolution, Ecology, and Data Analysis. Though the subject matters are freely developed accordingly, the "drug design" course is still challenging to insert. This is due to the insight of the course where the drug discovery process mainly focuses on the study of interaction between pharmacologically targets and molecules, which is the pharmacy area.

Criteria	Statement	Response
		Nevertheless, it can be developed by collaboration with biology, chemistry, pharmacy and medical programs. https://bit.ly/3QBoL3G (curriculum overview)
2.1	The employers also suggest better training of the students in information technology skills; this would further improve their job opportunities. The peers support this point of view and suggest putting a stronger focus on digital learning and teaching methods, scientific communication, and on how to use online tools in education. These areas are becoming more and more important in all scientific areas and all students should be able to communicate scientific concepts and ideas to pupils or the community. **(pp. 28, paragraph 3)**	We have several elective courses on ICT in learning, and there are two general courses in the university which is an obligation (Big data and programming). In addition to MBKM program on digital literacy, STEM, design thinking, etc. In addition, the students activities in summer schools and extracurricular provide new approach in ICT integration. https://bit.ly/3QBoL3G (curriculum overview)
2.2	FMIPA should analyse this situation and find out for what reasons undergraduate students in the educational programmes study significantly longer than undergraduate students in the regular programmes. After analysing the situation, appropriate measure should be taken in order to solve the identified problems. **(pp. 32, paragraph 4)**	We have identified the challenges of combining the education and subject matter courses, which required students to spend more time in school for teaching practicum, so they can't take more courses. In addition, during the pandemic, we face students' challenges in completing the course.
3	With respect to the exams, the peers are convinced that it would be useful to put more emphasis on questions related to transfer skills and critical thinking. The mid-term and final exams should not only verify if the students have learned the content by heart but if they understand the context and the reasoning behind it and are able to apply	In the chemistry and biology cluster (both at the bachelor's and master's), students' critical thinking is generally assessed through cognitive tests (e.g., midterm and final exams). However, it is also evaluated using non-tests, for example, using an observation form to assess student activity during debates and discussion sessions and a rubric to determine their final project. In this context, assignments and instruments designed by lecturers intend to maximize students' critical thinking and problem-solving skills. UNJ has also implemented case methods and team-based projects

Criteria	Statement	Response
	the acquired knowledge to new areas**.** In general, the examinations focus on learning by heart and **too little on the ability to solve problems** by self-determined application of what has been learnt. This easily can be improved but it requires more effort and open minded thinking from the teachers to design such exams and handle/accept even "unusual" solutions given by the students. **The students should be motivated to think free and to be brave to present own results which cannot be found directly in a textbook**. The peers point out that this is especially relevant for mid-term and final exams. Students should be trained in critical and analytical thinking and not only learn facts by heart; this should be reflected in the written exams. In addition, the share of exam questions dealing with transfer skills should be increased in the course of the degree programmes and should be highest in the latest semesters. The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. **(pp. 37, paragraph 4)**	in all courses at all levels. It aims for students in small groups to actively solve a case, analyze cases to offer solutions, test and develop solution designs, and have active discussions. In this case, the lecturer only acts as a facilitator who directs the discussion, asks questions, and provides constructive feedback. In addition, lecturers encourage each group to think critically and creatively in collaboration. Based on the regulations of the Rector of UNJ, students' active participation and critical discussion in a group and their final projects weigh at least 50% of the total final assessment and determine their graduation in a course. In the coming year, we will undoubtedly consider peer suggestions for designing higher-order thinking tests and using them as written tests. Our main commitment is to prepare graduates as critical thinkers and problem solvers ready to compete in the international community.
4.1	UNJ and FMIPA have a sufficient number of teachers with proper qualifications and competences. However, during audit discussions it was apparent that the teachers' English communication skills should	The numbers of lecturers in 2022 have an equal number of masters and doctoral qualifications. Some finished their study at overseas universities. Most numbers are from Indonesia. Nevertheless, some local graduates have already been exposed to international colleagues proven by shared publications, academic activity and many more. Moreover, in the last years, faculty have also facilitated their lecturer through English class training in collaboration with by Language Centre Unit of UNJ (LCU-

Criteria	Statement	Response
	be further improved, e.g. by exposure to more international colleagues. **(pp. 41, paragraph 2)**	UNJ) once a week. Faculty and universities have also promoted their lecturers to be part of the international academics' society through International Conference and Seminar. Nevertheless, the result is still compromised. A serious effort must be taken to cope with the issue.
4.3	the Master's programme Chemistry Education had a decrease in financial funds by 50 % from 2020 to 2021. UNJ's management explains that this decrease is mostly caused by a significant drop in acquired research funds by the teachers in the Master's programme Chemistry Education .**(pp. 43, paragraph 4)**	Funding for the Master's programme of Chemistry education has a slight 50% decrease from 2020 to 2021. The issue was due to the reduced number of research funding. We want to confirm that some research funding hasn't been included in the calculating system for IDR. 345.160.000/ EUR 23.022 and has been inserted in revised documents of cluster A. Thus the decrease in financial funds amounted to 40%.
4.3	There should be agreements between UNJ and the external institutes, which describe the content and extend of their contribution to teaching**. (pp. 44, paragraph 1)**	Agreement between UNJ and external institutes nationally or internationally has been established in many kinds of cooperation agreement of MOU, MOA, LOI and others. Physical evidence of the agreements can be found in appendix 4.7. Content and extension of their teaching contribution were further described in the form of a Term of reference for each collaborative activity. https://bit.ly/3dHuSFf (Collaboration)
4.3	In summary, the peer 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 programmes. **(pp. 45, paragraph 5)**	The integrated mathematics and sciences laboratory also completes the research activities, including Scanning Electron Microscopy/Energy Dispersive (SEM/EDS) and 200 HP Pavilion 27-d0733d computer for the computer laboratory. https://youtu.be/hpMCX8a0NxI (Faculty profile)
5.2	The peers confirm that the students of all programmes under review are awarded a Diploma Certificate and a Diploma Supplement after graduation. The provided sample Diploma Supplement for the Bachelor's degree programme Chemistry Edu-	Submit the example of a diploma supplement. (https://bit.ly/3Atused)

Criteria	Statement	Response
	cation contains almost all required information about the degree programme. However, it would be useful to include the PLO. In addition, UNJ should provide sample Diploma Supplements for the other degree programmes.**(pp. 47, paragraph 1)**	

F Summary: Peer recommendations (26.08.2022)

Taking into account the additional information and the comments given by UNJ, the peers 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	With requirements for one year	-	30.09.2028
Ba Biology Education	With requirements for one year	-	30.09.2028
Ma Biology Education	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Chemistry Education	With requirements for one year	-	30.09.2028
Ma Chemistry Education	With requirements for one year	-	30.09.2028

Requirements

For all degree programmes

A 1. (ASIIN 2.2) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 4.3) Make sure that the safety measures in the laboratories are followed strictly and all laboratories need to be equipped with the necessary safety equipment.

A 3. (ASIIN 5.2) The module descriptions need to be made transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted.

A 4. (ASIIN 6) Close the feedback cycles and discuss with the students directly about the results of the course questionnaires.

For the Bachelor's programmes

A 5. (ASIIN 2.1) Undergraduate students need to get more hands-on experience with practical laboratory techniques and instruments, the share of practical laboratory work should be increased.

A 6. (ASIIN 4.3) The technical equipment and the instruments in the areas cellular and molecular biology and analytical chemistry need to be improved and updated.

For the Bachelor's degree programmes Biology and Biology Education

A 7. (ASIIN 2.1) Make transparent in the study plans what different options for MBKM exist, how many credits are awarded, and what part is compulsory and what is optional.

A 8. (ASIIN 5.2) Rewrite the module descriptions to include information about the content, qualification objectives, teaching formats, ECTS points, students' workload, exams, and literature references.

For the Bachelor's degree programme Chemistry Education

A 9. (ASIIN 2.1) Make transparent in the study plan if the course "entrepreneurship" is a compulsory or an optional course. If it is an elective, the intended learning outcomes of the degree programme must me adjusted, because becoming an entrepreneur is part of the graduates' qualification profile.

Recommendations

For all degree programmes

E 1. (ASIIN 2.1) It is recommended to further promote the students' academic mobility and to provide more places and scholarships for international exchange programmes.

E 2. (ASIIN 2.1) It is recommended to put a stronger focus on digital learning and teaching methods, scientific communication, and how to use online tools in education.

E 3. (ASIIN 2.1) It is strongly recommended to teach students more about current developments in modern areas of chemistry and biology, for example with respect to molecular biology, genetics, bioinformatics, biodiversity, sustainability, green chemistry, and ecology.

E 4. (ASIIN 3) It is recommended to put more emphasis in the exams on assessing transfer skills and critical thinking.

E 5. (ASIIN 6) It is recommended to make student representatives members of the quality assurance units at UNJ at programme or department level and to directly involve them in the decision making processes for further developing the degree programmes.

For the Bachelor's programmes

E 6. (ASIIN 2.1) It is recommended to offer international classes, which are taught in English.

G Comment of the Technical Committees (06.09.2022)

Technical Committee 09 – Chemistry, Pharmacy (29.08.2022)

Assessment and analysis for the award of the ASIIN seal:

This was the first ASIIN accreditation procedure at this university and it was evident during the procedure that the university had little experience with international accreditation procedures. The English language skills of many of the responsible persons and teachers are also not as good as at other Indonesian universities, so a large part of the discussions had to be translated, which made the procedure somewhat tough. The main points of criticism from the peer group relate to the consistency of the awarded ECTS points and the students' workload, the safety standards and technical equipment in the laboratories, the scope of the practical study components, the consideration of modern scientific fields in the curriculum, quality assurance, internationalisation, and the forms of examination. Thus, there is a need for improvement in many areas and the peers recommend accreditation with nine requirements and six recommendations.

The Technical Committee discusses the procedure and agrees with the 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 Biology	With requirements for one year	-	30.09.2028
Ba Biology Education	With requirements for one year	-	30.09.2028
Ma Biology Education	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Chemistry Education	With requirements for one year	-	30.09.2028

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ma Chemistry Education	With requirements for one year	-	30.09.2028

Technical Committee 10 – Life Sciences (06.09.2022)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and is in favour of upgrading recommendation E4 to a requirement in order to signal the importance of this point to the university. The Technical Committee proposes a slight rewording in the requirement A2. The remaining requirements and recommendations are approved without any changes.

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	With requirements for one year	-	30.09.2028
Ba Biology Education	With requirements for one year	-	30.09.2028
Ma Biology Education	With requirements for one year	-	30.09.2028
Ba Chemistry	With requirements for one year	-	30.09.2028
Ba Chemistry Education	With requirements for one year	-	30.09.2028
Ma Chemistry Education	With requirements for one year	-	30.09.2028

Requirements

For all degree programmes

A 2. (ASIIN 4.3) Make sure that the safety measures in the laboratories are followed strictly; all laboratories need to be equipped with the necessary safety equipment.

A 5. (ASIIN 3) Put more emphasis in the exams on assessing transfer skills and critical thinking.

H Decision of the Accreditation Commission (23.09.2022)

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

The Accreditation Commission discusses the procedure in detail, in particular about the inclusion of current developments in modern areas of chemistry and biology, the safety measures in the laboratories, and the technical equipment. The AC agrees with the suggestion of TC 10 to change recommendation E4 to a requirement in order to signal the importance of this point to the university. In addition, the wording of the requirements A2, A8, and A10 is slightly changed. Otherwise, the TC agrees with the proposed requirements and recommendations.

The Accreditation Commission decides to award the following seals:

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

Requirements

For all degree programmes

A 1. (ASIIN 2.2) Verify the students' total workload and award the ECTS points accordingly.

A 2. (ASIIN 4.3) Make sure that the safety measures in the laboratories are followed strictly; all laboratories need to be equipped with the necessary safety equipment.

A 3. (ASIIN 5.2) The module descriptions need to be make transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted.

A 4. (ASIIN 6) Close the feedback cycles and discuss with the students directly about the results of the course questionnaires.

A 5. (ASIIN 3) Put more emphasis in the exams on assessing transfer skills and critical thinking.

For the Bachelor's programmes

A 6. (ASIIN 2.1) Undergraduate students need to get more hands-on experience with practical laboratory techniques and instruments, the share of practical laboratory work should be increased.

A 7. (ASIIN 4.3) The technical equipment and the instruments in the areas cellular and molecular biology and analytical chemistry need to be improved and updated.

For the Bachelor's degree programmes Biology and Biology Education

A 8. (ASIIN 2.1) Make transparent in the study plans what different options for MBKM exist, how many credits are awarded, and which part is compulsory and what is optional.

A 9. (ASIIN 5.2) Rewrite the module descriptions to include information about the content, qualification objectives, teaching formats, ECTS points, students' workload, exams, and literature references.

For the Bachelor's degree programme Chemistry Education

A 10. (ASIIN 2.1) Make transparent in the study plan whether the course "entrepreneurship" is a compulsory or an optional course. If it is an elective, the intended learning outcomes of the degree programme must be adjusted, because becoming an entrepreneur is part of the graduates' qualification profile.

Recommendations

For all degree programmes

E 1. (ASIIN 2.1) It is recommended to further promote the students' academic mobility and to provide more places and scholarships for international exchange programmes.

E 2. (ASIIN 2.1) It is recommended to put a stronger focus on digital learning and teaching methods, scientific communication, and how to use online tools in education.

E 3. (ASIIN 2.1) It is strongly recommended to teach students more about current developments in modern areas of chemistry and biology, such as molecular biology, genetics, bioinformatics, biodiversity, sustainability, green chemistry, and ecology.

E 4. (ASIIN 6) It is recommended to make student representatives members of the quality assurance units at UNJ at programme or department level. Directly involve them in the decision making processes for further developing the degree programmes.

For the Bachelor's programmes

E 5. (ASIIN 2.1) It is recommended to offer international classes, which are taught in English.

I Fulfillment of Requirements (22.09.2023)

Analysis of the peers and the Technical Committees (05.09.2023)

Requirements

For all programmes

A 1. (ASIIN 2.2) Verify the students' total workload and award the ECTS points accordingly.

Initial Treatment	
Peers	Fulfilled Vote: unanimous Justification: UNJ has explained the details of the workload and they also have revised all of module descriptions accordingly. The verification of actual workload has been confirmed by a students' survey. However, the module descriptions are not all accessible via the programme's homepage because the "download limit has been reached".
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

For the Biology, Chemistry programmes

A 2. (ASIIN 4.3) Make sure that the safety measures in the laboratories are followed strictly; all laboratories need to be equipped with the necessary safety equipment.

Initial Treatment	
Peers	Not fullfilled Vote: unanimous Justification: The peers confirm that FMIPA takes the safety measures seriously. We see fume hoods in the chem labs (also clean benches in bio labs), but only one in each lab which isn't enough. However, in the videos nobody working in the labs uses eye protecting glasses and in one video there is a student in the

	lab who loads an autoclave barefoot! FMIPA has to make sure that all safety regulations are strictly followed by all students.
TC 09	Not fulfilled Vote: unanimous Justification: The TC confirms the experts' assessment that the requirement is not fulfilled.
TC 10	Not fulfilled Vote: unanimous Justification: The experts agree with the experts' assessment to consider the requirement as not fulfilled.

A 3. (ASIIN 5.2) The module descriptions need to make transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted.

Initial Treatment	
Peers	Not fulfilled Vote: unanimous Justification: FMIPA does still not make transparent how many hours students spend in the laboratory in each course per week and what experiments are conducted. The course modules explain the workload in detail, but the practical courses are focusing on the practical procedures and do not detail how much time students spend on the different experiments.
TC 09	Not fulfilled Vote: unanimous Justification: The TC confirms the experts' assessment that the requirement is not fulfilled.
TC 10	Not fulfilled Vote: unanimous Justification: The experts agree with the experts' assessment to consider the requirement as not fulfilled.

A 4. (ASIIN 6) Close the feedback cycles and discuss with the students directly about the results of the course questionnaires.

Initial Treatment	
Peers	Fulfilled Vote: unanimous

	Justification: Lecture Monitoring and Evaluation Report can be accessed easily from the link provided by UNJ. The dialogue between the students with the head of study program and lectures also shows that UNJ has fulfill this requirement.
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

A 5. (ASIIN 3) Put more emphasis in the exams on assessing transfer skills and critical thinking.

Initial Treatment	
Peers	Not fulfilled Vote: unanimous Justification: UNJ and FMIPA have not submitted any documents showing that they have addressed this issue.
TC 09	Not fulfilled Vote: unanimous Justification: The TC confirms the experts' assessment that the requirement is not fulfilled.
TC 10	Not fulfilled Vote: unanimous Justification: The experts agree with the experts' assessment to consider the requirement as not fulfilled.

For the Bachelor's programmes

A 6. (ASIIN 2.1) Undergraduate students need to get more hands-on experience with practical laboratory techniques and instruments, the share of practical laboratory work should be increased.

Initial Treatment	
Peers	Fulfilled Vote: unanimous Justification: FMIPA has applied an extensive and very detailed proposal for laboratory extension including laboratory equipment like fume hoods, modern analysis devices as GC/MS, FT-IR, XRD, PC in an extent of about 45,2 Mrd IDR which means about 2,7 Mio Euro. This agrees very well with the suggestions of the peers to use

	the actual situation for improvement of laboratory infrastructure as basis for practical education and research..
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees with the experts' assessment.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

A 7. (ASIIN 4.3) The technical equipment and the instruments in the areas cellular and molecular biology and analytical chemistry need to be improved and updated.

Initial Treatment	
Peers	Not fulfilled Vote: unanimous Justification: The commitment letter of the Rector is not really binding. The proposal related to instrument improvement does not meet the requirements as related in the accreditation report with respect to analytical chemistry and molecular biology. UNJ should describe the details on those two areas and make transparent when the budget planning to cover the requests will be confirmed.
TC 09	Not fulfilled Vote: unanimous Justification: The TC confirms the experts' assessment that the requirement is not fulfilled.
TC 10	Not fulfilled Vote: unanimous Justification: The experts agree with the experts' assessment to consider the requirement as not fulfilled.

For the Bachelor's degree programmes Biology and Biology Education

A 8. (ASIIN 2.1) Make transparent in the study plans what different options for MBKM exist, how many credits are awarded, and which part is compulsory and what is optional.

Initial Treatment	
Peers	Fullfilled Vote: unanimous

	Justification: FMIPA has updated the study plans, which now include information on what different options for MBKM exist, how many credits are awarded, and which part is compulsory and what is optional.
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

A 9. (ASIIN 5.2) Rewrite the module descriptions to include information about the content, qualification objectives, teaching formats, ECTS points, students' workload, exams, and literature references.

Initial Treatment	
Peers	Fullfilled Vote: unanimous Justification: The module descriptions have been updated, they now include all the required information. However, the module descriptions are not all accessible via the programme's homepage because the "download limit has been reached".
TC 10	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

For the Bachelor's degree programme Chemistry Education

A 10. (ASIIN 2.1) Make transparent in the study plan whether the course "entrepreneurship" is a compulsory or an optional course. If it is an elective, the intended learning outcomes of the degree programme must be adjusted, because becoming an entrepreneur is part of the graduates' qualification profile.

Initial Treatment	
Peers	Fulfilled Vote: unanimous / per majority Justification: UNJ has clarified the revision that Entrepreneurship course is compulsory. They updated the curriculum document and put it on the website.
TC 09	Fulfilled Vote: unanimous Justification: The TC agrees that the requirement is fulfilled.

Decision of the Accreditation Commission (22.09.2023)

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Biology	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months
Ba Biology Education	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months
Ma Biology Education	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months
Ba Chemistry	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months
Ba Chemistry Education	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months
Ma Chemistry Education	Requirements A2, A3, A5, and A7 not fulfilled	-	30.09.2028/prolongation for six months

Appendix: Programme Learning Outcomes and Curricula

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

Programme Educational Objectives (PEO):

Based on the graduate's profiles and competencies, the PEO are designed as follows:

1. Be able to acknowledge basic mathematics and natural sciences, fundamental biology, molecular and cell organisms, and other related fields.

2. Be able to utilize their knowledge and skills based on research methodology to solve a problem on biology and other related issues.

3. Be able to communicate in teamwork to collaborate and create networking.

4. Be able to have good ethics in the academic, social, and environmental context.

5. Be able to develop knowledge for further study and work needs as a long-life learner.

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcome
Social Competence	PLO1	To show religious attitude, good ethics, social awareness, responsibility, leadership.
	PLO 2	Be able to apply logical, critical, systematic, innovative, scientific thinking and methods to solve biology and other related fields.
	PLO 3	Be able to show good communication skills in the social and academic context, disseminate scientific information communicatively and responsibly concerning cultural environments, build networks and collaboration.
Specialist competences	PLO 4	Be able to understand the concepts and applications of basic mathematics and natural sciences.
	PLO 5	Be able to comprehensively and suitably acquire knowledge of cellular and molecular biology, physiology, genetics, structure and development, biosystematics and biodiversity, evolution, and ecology.
	PLO 6	Be able to acquire other relevant knowledge in an integrated and sustainable manner.

Area	Code	Programme Learning Outcome
	PLO 7	Be able to apply the scientific method in solving biology and other relevant contexts, including an approach to extensive data analysis.
	PLO 8	Be able to continuously apply biological knowledge in designing and producing creative and innovative products.
	PLO 9	Be able to plan, manage, apply and evaluate laboratory and field tasks independently with consideration for health and environmental safety.

The following **curriculum** is presented:

Course code	Course Name	CP	ECTS	PLO								
				1	2	3	4	5	6	7	8	9
Semester 1												
30050062	Indonesian Language	2	3.0	v								
30051121	Olympism	1	1.5	v								
00051112	Pancasila	2	3.0	v								
34251632	General Biology	3	4.5			v	v					
34251641	Practicum of General Biology	1	1.5		v	v						
32251012	Basic Physics	2	3.0				v					
32251021	Basic Physics practicum	1	1.5			v						
34251512	Occupational and Health Safety	2	3.0				v					

Course code	Course Name	CP	ECTS	PLO								
				1	2	3	4	5	6	7	8	9
34251652	Basic Chemistry	2	3.0				v					
34251661	Practicum of Basic Chemistry	1	1.5			v						
34250093	Basic Mathematics	3	4.5				v					
	Total CP	**20**	**30**									
Semester 2												
00052033	Religion Education	3	4.5	v								
00051262	Basic Social and Cultural Sciences	2	3.0	v								
34250862	English for Biology 1	2	3.0			v						
34251673	Biochemistry and Organic Chemistry	3	4.5		v		v					
34251681	Practicum of Biochemistry and Organic Chemistry	1	1.5			v	v					
34251693	Animal Structure and Development	3	3.0			v		v				
34251701	Practicum of Animal Structure and Development	1	1.5			v		v				
34251713	Plant Structure and Development	3	4.5			v		v				
34251721	Practicum of Plant Structure and Development	1	1.5			v		v				
	Total CP	**19**	**28.5**									
Semester 3												
51062	Civic Education	2	3.0	v								
34251732	Biodiversity and Systematics of the Cryptograms	2	3.0		v			v				
34251741	Practicum of Biodiversity and Systematics Cryptograms	1	1.5			v		v				
34251752	Biodiversity and Systematics of Invertebrates	2	3.0		v			v				
34251761	Practicum of Biodiversity and Systematics Invertebrates	1	1.5			v		v				
34250603	Cell Biology	3	4.5		v			v				
34250013	Environmental Science	3	4.5		v	v		v				
34250142	Basic statistics	2	3.0		v		v					
	Introduction to Programming and Big Data	2	3.0								v	
	Elective courses (2 courses)	4	9.0									
	Total CP	**22**	**23.5**									
Elective courses												
34251412	1. Human Biology	2	3.0		v				v			
34251132	2. Nutrition and Health	2	3.0		v				v			
34250822	3. Animal Bioethics	2	3.0	v					v			
34251502	4. Animal Behavior	2	3.0			v			v			
34250462	5.Mycology	2	3.0		v			v				
	6. Phycology	2	3.0		v			v				
34251523	7. Fundamentals of Horticulture	3	4.5		v	v		v				
Semester 4												
34251772	Biodiversity and Systematics of Phanerogams	2	3.0		v			v				
34251781	Practicum of Biodiversity and Systematics Phanerogams	1	1.5			v		v				
34251842	Biodiversity and Systematics of Vertebrate	2	3.0		v			v				
34251851	Practicum of Biodiversity and Systematics Vertebrate	1	1.5			v		v				
34251793	Genetics	3	4.5		v			v				
34251801	Practicum of Genetics	1	1.5			v		v				
34251822	Microbiology	2	3.0		v			v				
34251831	Practicum of Microbiology	1	1.5			v		v			v	
34251812	Research Methodology of Biology	2	3.0		v					v		
34251373	Entrepreneurship in Biology	3	4.5		v							v
	Elective courses (2 courses)	4	6.0									
	Total CP	**22**	**33**									
Elective courses												
34250662	1. Pteridology	2	3.0					v				v
	2. Bryology	2	3.0					v				v
34250532	3. Economic Botany	2	3.0						v		v	

Course code	Course Name	CP	ECTS	PLO								
				1	2	3	4	5	6	7	8	9
	4. Orchidology	2	3.0		v				v			v
34251492	5. Histology	2	3.0						v			
Semester 5												
34250812	Research design	2	3.0		v					v		
34251862	Molecular Biology	2	3.0		v			v				
34252051	Practicum of Molecular Biology	1	1.5				v	v				
34251893	Animal Physiology	3	4.5		v			v				
34251901	Practicum of Animal Physiology	1	1.5			v		v				
34251913	Plant Physiology	3	4.5		v			v				
34251921	Practicum of Plant Physiology	1	1.5			v		v				v
	Elective courses (3-4 courses)	9	13.5									
	Total CP	**22**	**33**									
Elective courses												
34251523	1.Microbial Plant Pathogen	3	4.5		v			v				v
34252132	2.Population Genetics	2	3.0		v			v				
34250682	3.Plant Micro technique	2	3.0						v	v		
34250512	4.Animal Micro technique	2	3.0						v	v		
34250282	5.Ornithology	2	3.0					v				v
34252093	6.Entomology (MBKM)	3	4.5						v			v
34250442	7.AMDAL	2	3.0		v				v			
	8.Urban Biodiversity	2	3.0		v			v				
34250842	9.Biosistematics of Microorganisms	2	3.0					v			v	
34251402	10.Biology of Yeast	2	3.0					v			v	
34251382	11.Bacteriology	2	3.0					v			v	
34251533	12.Food Microbiology	2	3.0					v	v		v	
Semester 6												
34251873	Fundamental of Ecology	3	4.5		v			v				
34251881	Practicum of Fundamental of Ecology	1	1.5		v			v				
34251932	Plant Tissue Culture	2	3.0					v	v			
34251941	Practicum of Plant Tissue culture	1	1.5			v		v				
34251092	Biotechnology	2	3.0		v			v				
34250212	Evolution	2	3.0		v			v				
34251952	Techniques on Scientific Writing	2	3.0		v	v					v	
	Elective courses (3-4 courses)	8	12									
	Total CP	**22**	**33**									
Elective courses												
	1.Plant Virology	2	3.0		v			v				v
	2.Genetics Conservation (MBKM)	2	3.0		v			v				
34252122	3.Secondary Metabolites in Plant	2	3.0		v			v				
34252073	4.Plant nutrition	2	3.0		v	v		v				
34251102	5.Biogeography	2	3.0		v			v				
34250262	6. Animal Research Husbandry	2	3.0		v				v			
34251422	7. Animal Bio reproduction	2	3.0		v					v		
34251992	8. Animal Endoparasite	2	3.0		v			v				
34252042	9. Animal Endocrinology (MBKM)	2	3.0		v			v				
34250772	10.Limnology	2	3.0						v			v
34252063	11. Physiology of Marine Life (MBKM)	3	4.5					v	v			
34251393	12.Fungi Biodiversity	3	4.5					v				
34250642	13. Environmental Microbiology	2	3.0					v	v			
	14. Enzymology	2	3.0		v			v				
Semester 7												
34251202	Field work (KKL)	2	3.0		v	v		v	v			v
34250782	Internship programme	3	4.5	v	v	v						
30052072	Seminar on research proposal	2	3.0		v	v				v		v
	Elective courses (3-4 courses)	8	12									
	Total CP	**15**	**22.5**									

Course code	Course Name	CP	ECTS	PLO								
				1	2	3	4	5	6	7	8	9
Elective courses												
34252023	1.Plant Ecophysiology (MBKM)	3	4.5		v	v		v				
34251553	*2. Plant Reproduction and Breeding*	3	4.5			v		v				
34250852	3.Plant Biotechnology	2	3.0			v		v				
34250722	4. Plant Ecology	2	3.0		v			v				
	5. Phytoremediation	2	3.0		v				v			
34251192	6.Teratology	2	3.0		v			v				
34251432	7. Animal Biotechnology	2	3.0			v		v				
34251982	8. Animal Ectoparasite	2	3.0		v			v				
34251172	9.Immunology	2	3.0		v							
34250002	10.Marine Ecology	2	3.0			v					v	v
	11.Biology Conservation (MBKM)	3	4.5						v			v
34252103	12. Fundamentals of Bioinformatics	2	3.0		v					v		
	13. English for Biology 2	2	3.0	v		v						
Semester 8												
30052004	Thesis	4	6.00		v	v		v	v		v	
	Total CP	4	6.00									
	TOTAL CREDITS	**144**	**216**									

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

Programme Educational Objectives (PEO):

The PEO of the Bachelor of Biology Education Study Programme is to have graduates as Biology Teacher, Biology Laboratory Manager, and Entrepreneur. The graduates are expected to have the ability to:

1. plan, develop, implement, and evaluate biology learning professionally and globally competitively by utilizing digital technology.

2. Manage biology education laboratories by minding safety, occupational health, and environmental aspects according to national and international standards.

3. Design, implement and evaluate entrepreneurial activities in biology and biology education.

4. Master professional ethics and responsibility

5. have the ability to further self-development (life-long learning).

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcomes
Specialist competences	PLO 1	Be able to understand the basic concepts of science (basic mathematics, physics, chemistry, and general biology).
	PLO 2	Be able to understand the concept of biology cell and molecular, development structure, biosystematics and evolution, physiology, genetic and biotechnology, ecology, environment, and conservation.
	PLO 3	Be able to implement strategic management, biology laboratory management, and field study in a unit of education.
	PLO 4	Be able to understand the research procedures and research publication in biology education and the biology field of study.
	PLO 5	Be able to solve problems and make decisions on biology cell and molecular study, development structure, biosystematics and evolution, physiology, genetic and biotechnology, ecology, environment, and conservation by implementing relevant knowledge, method, and technology in multidisciplinary areas of study.
	PLO 6	Be able to manage a biology learning laboratory based on a classroom, field, and virtual laboratory.
	PLO 7	Be able to conduct research and publish a research publication in biology education and the biology field of study.

Social competences	PLO 8	Be able to Show religious attitude, good ethics, social awareness, responsibility, and leadership.
	PLO 9	Be able to integrate values, norms, and academic ethics.
	PLO 10	Show some thinking abilities which are conceptual, analytic, logical, critical, creative, and innovative to solve problems.
	PLO 11	Have some abilities in social sensibility, ethics, and caring attitude to the society.
	PLO 12	Have some abilities in communication, literation, leadership, and self-development strategy.
	PLO 13	Be able to understand and implement the philosophy of education in the *Technological Pedagogical Content Knowledge* (TPACK) learning base.
	PLO 14	Be able to understand working ethics in the biology education field of study.
	PLO 15	Be able to analyze and generate ideas for entrepreneurship programmes in biology education and the biology field of study.
	PLO 16	Be able to implement biology teacher competencies with *Technological Pedagogical Content Knowledge* (TPACK) learning base.
	PLO 17	Be able to understand working ethics in the biology education field of study.
	PLO 18	Be able to design and implement a programme of entrepreneurship based on biology education and biology field of study.

The following curriculum is presented:

Course code	Course Name	CP	ECTS	PLO																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Semester 1																					
34155302	Pancasila	2	3.0								v	v		v							
51132	Indonesian language	2	3.0								v				v						
34155342	Foundation of Education	2	3.0													v				v	
34150012	Basic Mathematics	2	3.0	v																	
34155011	English	1	1.5																		
34150422	Basic Chemistry	2	3.0	v																	
34151461	Basic Biology	2	3.0	v	v			v													
34155302	Practicum of Basic Biology	1	1.5			v		v	v												
51132	Basic Physic	2	3.0	v																	
34155342	Practicum of Basic Physic	2	3.0			v			v												
	Olympism	1	1.5			v															
	Total CP	**19**	**28.5**																		
Semester 2																					
52033	Religion	3	4.5								v	v									
52102	Learner Development	2	3.0														v			v	
34155172	Plant Structure and Development	2	3.0		v			v													
34155181	Practicum Plant Structure and Development	1	1.5			v		v	v												
34155152	Animal Structure and Development	2	3.0		v			v													
34155161	Practicum of Animal Structure and Development	1	1.5			v		v	v												
34150122	Biochemistry	2	3.0		v			v													
34154991	Practicum of Biochemistry	1	1.5			v		v	v												
30051102	Philosophy of Natural Sciences	2	3.0										v			v					
51112	Civic Education	2	3.0								v	v		v							
	Elective (1 course)	2	3.0																		
	Total CP	**20**	**27**																		
Semester 3																					
52144	Learning and Instructional Theories	4	3.0													v			v	v	
34150842	Basic Statistics	2	3.0				v						v								
34150562	Cell Biology	2	3.0		v			v													
34155312	Cryptogamic Botany	2	3.0		v			v													
34155321	Practicum of Cryptogamic Botany	1	1.5			v		v	v												
34155332	Environmental Education	2	3.0		v			v						v							
34155062	A vertebrate Zoology	2	3.0		v			v													

Course code	Course Name	CP	ECTS	PLO																
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
34155071	Practicum of A vertebrate Zoology	1	1.5			v		v	v												
	Elective (3 courses)	6	9.0																		
	Total CP	**22**	**33**																		
Semester 4																					
34155132	Genetic	2	3.0		v			v									v		v	v	
34155082	Vertebrate Zoology	2	3.0		v			v													
34155091	Vertebrate Zoology Practicum	1	1.5			v		v	v												
34155022	Phanerogamic Botany	2	3.0		v			v													
34155031	Phanerogamic Botany Practicum	1	1.5			v		v	v												
34151122	Research Methodology	2	3.0				v						v								
30052012	Teaching Methodology	2	3.0										v				v				
34153022	Animal Physiology	2	3.0		v			v													
34155101	Animal Physiology Practicum	1	1.5			v		v	v												
34155112	Plant Physiology	2	3.0		v			v													
34155121	Plant Physiology Practicum	1	1.5			v		v	v												
34155141	Genetic Practicum	1	1.5			v		v	v												
	Elective (1 course)	2	3.0																		
	Total CP	**21**	**31.5**																		
Semester 5																					
30052022	Instructional Planning, Management, and Evaluation	2	3.0											v				v			
34155192	Microbiology	2	3.0		v			v													v
34155201	Microbiology Practicum	1	1.5			v		v	v												v
34150182	Human Anatomy and Physiology	2	3.0		v			v													
34154981	Human Anatomy and Physiology Practicum	1	1.5			v		v	v												
34150632	Ecology	2	3.0		v			v													
34155051	Ecology Practicum	1	1.5			v		v	v												
34150192	Evolution	2	3.0		v			v													
	Elective (3-4 courses)	6	9.0																		
	Total CP	**19**	**28.5**																		
Semester 6																					
34153212	Seminar on Biology Education	2	3.0				v					v									
34152092	Excursion Study	2	3.0			v	v	v	v	v		v	v								
34152112	Teaching Competency Development	2	3.0													v	v	v		v	v
34154012	Seminar on Pre-Undergraduate Thesis	2	3.0															v			
	Elective (6 courses)	12	18.0																		

Course code	Course Name	CP	ECTS	PLO																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Total CP	**20**	**30**																		
Semester 7																					
30054062	Pre-Thesis Seminar	2	3.0				v			v		v									
34155362	School Environment Practice	6	9.0				v			v		v									
	Elective (6 courses)	12	18.0																		
	Total CP	**20**	**21**																		
Semester 8																					
	Thesis	4	6.0				v			v											
	Total CP	**4**	**6.0**																		
	TOTAL CREDITS	**144**	**216**																		
Elective Courses																					
34150262	Education of Family Life (PK2)	2	3.0		V			v													
34154312	Nutrition snd Health Science	2	3.0		v			v													
34150432	Histology	2	3.0		v			v													
30051121	Olympism	2	3.0									v		v	v						
34155222	Character Building Education	2	3.0									v		v	v						
34251352	KUBB	2	3.0															v			v
34250982	Plant Anatomy	2	3.0		v			v													
34151342	Plant Microtechnic	2	3.0			v		v	v									v			v
34154812	Visual Audio Media	2	3.0														v	v	v		
34153092	Parasitology	2	3.0		v			v													
34150312	Entomology	2	3.0		v			v													
34154912	Foundations of Bioinformatics	2	3.0				v									v			v		
34151362	Natural Science Learning	2	3.0													v			v	v	
34154112	Bioconservation	2	3.0		v			v						v							
34150302	Endocrinology	2	3.0		v			v													
34154352	Immunology	2	3.0		v			v													
34152102	Tropical Forest Ecology	2	3.0		v			v													
34153142	Scientific Publications	2	3.0				v					v									
34151442	Instrcutional Designs	2	3.0														v		v		
34153152	Learning Innovations	2	3.0														v		v		
34151452	Biology Learning Instruments	2	3.0														v		v		
34154562	Classroom-Based Study	2	3.0				v					v			v		v				
34153222	Geographic System of Information	2	3.0					v													
34154552	AMDAL	2	3.0		v			v													
34154512	Limnology	2	3.0		v			v													
34154482	Ocean Ecology	2	3.0		v			v													

Course code	Course Name	CP	ECTS	PLO																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
34153132	Biodiversity	2	3.0		v			v													
34153192	Applied Microbio for School	2	3.0					v										v			
34150382	Enzymology	2	3.0		v			v													
34151432	Fitrochemistry	2	3.0		v			v													
34154572	Learning Evaluation	2	3.0														v		v		
34154932	Primatology	2	3.0		v			v													
34154902	Reasearch Development	2	3.0				v												v	v	
34154922	Biology Learning Technology	2	3.0														v		v		
34153192	Reproduction Biology	2	3.0		v			v													
34155282	Digital Learning	2	3.0														v		v		

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

The PEO of Master of Biology Education Programme are to have graduated as educators, researchers, and consultants in the field of Biology Education, which is described as follows:

1. Be able to design, implement, succeed, and assess biology learning based on local wisdom and digital technology.

2. Be able to design and carry out research in biology and biology education and communicate it in various scientific forums.

3. Be able to design curriculum and management of education units and implement them in lifelong learning.

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcome
Social Competences	PLO1	Have integrity, working ethics, Self-development, and do some learning innovations to improve quality of life-based on life-long learning (PLO1)
	PLO2	Be able to implement analytical thinking, critical thinking, innovative thinking, and abstraction in the biology education area of study (PLO2).
	PLO3	Be able to cooperate in multicultural group work and collaborate with stakeholders to solve a problem in education (PLO3).

Specialist Competences	PLO4	Be able to develop the knowledge of educational philosophy and theory in biology education and biology instruction (PLO4).
	PLO5	Be able to design and organize a biology learning process with classical-based approach, laboratory-based approach, natural-based approach, and digital/virtual-based approach in a unit of education.
	PLO6	Be able to design and publish research through any approach/method to solve an issue in the biology education area of study (PLO5).
	PLO7	Be able to organize and develop learning based on digital technology relevant to characteristics and students' potentials. (PLO6).
	PLO8	Be able to design and conduct an evaluation and assessment of learning in a unit of education (PLO7).
	PLO9	Be able to improve the mastering of biology learning materials in plant and animal structures, environment, bio conservation, biomolecular, and biotechnology (PLO 8).
	PLO10	Be able to analyze and synthesize a solution for a problem in the biology learning process through interdisciplinary, transdisciplinary, and multidisciplinary approaches.

The following curriculum is presented:

Semester	Course code	Course Name	CP	ECTS
1	30081013	Philosophy of science	3	7,8
	34181024	Design instructional of biology	4	10,4
	34182014	Genetic Molecular dan Biotechnology	4	10,4
	34182033	Ecology, environment dan conservation	3	7,8
		Elective course 1	2	5,2
		Elective course 2	2	5,2
		Amount	**16**	**46,8**
2	30082013	Statistic of Education	3	7,8
	30082023	Research Methodology	3	7,8
	34182024	Evaluation of Biology learning	2	5,2
	34363072	Structure, Development and Physiology of Plant	2	5,2
	34363082	Structure, Development and Physiology of animal	2	5,2
	34182042	Contemporary issues of biology and biology education	2	5,2
		Elective course 3	2	5,2
		Amount	**18**	**41,6**
3	341831042	Biology learning tools	2	5,2
	30083042	Thesis Seminar	2	5,2
		Elective course 4	2	5,2
		Amount	**6**	**15,6**
4	30084024	Thesis	6	15,6
		Amount	**6**	**15,6**
			46	**119,6**

Electives:

No.	Course Codes	Courses	Credits	ECTS	Semester
1	34363022	Neuroscience	2	5,2	Available in every semester
2	34361022	Scientific Publications	2	5,2	
3	34261012	Bioinformatics in Biology Learning	2	5,2	
4	34363012	Information Technology in Biology Learning	2	5,2	
5	34363052	School Based Management	2	5,2	
6	34361032	Online Learning Development	2	5,2	
7	34361042	Applied Microbiology	2	5,2	
8.	34261002	Digital Learning tools	2	5,2	
9.	34361052	Out Door learning Model	2	5,2	

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

The PEO of the Chemistry Study Programme are to nurture graduates who are qualified as scientists, academics, industry experts, and entrepreneurs at the beginning of their careers. The programme provides the opportunity for graduates to be able to:

1. have substantial knowledge, skill, and competency for problem-solving in chemistry to advance in diverse career paths or pursue a higher degree in chemistry.

2. be professionals with appropriate soft skills and excellent work ethics.

3. demonstrate a professional attitude, integrity, and increased responsibility to the community and global society.

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcome
Social Competence	PLO 1	Be able to demonstrate internalized academic and humanity values.
	PLO 2	Be able to demonstrate excellence, honesty, competitiveness, leadership, and social sensitivity to society and the environment.
	PLO 3	Be able to demonstrate performance independently or as part of a team professionally and measurably by applying interdisciplinary knowledge and skill, critical, and creative thinking in the context of being a life-long learner.
	PLO 4	Have the ability to compile scientific papers based on the analysis of information and research data and communicate them in an oral or written format to scientists and the wider public.
Specialist competences	PLO 5	Be able to integrate mathematical and basic concepts of science to solve problems in chemistry.
	PLO 6	Be able to master the knowledge of chemistry (organic and inorganic chemistry, analytical, physical, and biochemical), which includes structure, properties, functions, changes, energy and dynamics, identification, separation, characterization, transformation, and synthesis of micromolecular chemicals and their application.
	PLO 7	Be able to understand concepts and applications in biosciences and materials chemistry to solve problems in the field of chemistry and its applications.

Area	Code	Programme Learning Outcome
	PLO 8	Be able to understand operational knowledge about functions, operate chemical instruments, and analyze data and information from these instruments.
	PLO 9	Be able to understand work safety, ethics, environmental issues, and policies related to the chemical field.
	PLO 10	Be able to carry out laboratory and research work by paying attention to the safety and security of laboratory work and applying responsible scientific behaviour.
	PLO 11	Be able to obtain, process, interpret, and evaluate scientific data and produce conclusions by considering scientific and technological aspects and scientific ethics.
	PLO 12	Be able to solve science and technology problems in chemistry independently based on relevant scientific methodologies and present it as a scientific work.

The following **curriculum** is presented:

Course code	Course Name	CP	ECTS	PLO											
				1	2	3	4	5	6	7	8	9	10	11	12
Semester 1															
00051142	Indonesian	2	3	v											
30050042	English	2	3.0				v								
00051122	Pancasila Education	2	3.0	v	v	v									
30051122	Olympism	1	1.5	v	v	v									
32251062	Basic Physics	2	3.0			v		v							
32251011	Practicum of Basic Physics	1	1.5			v		v					v		
34150013	General Biology	2	3.0			v		v							
33251083	Basic Chemistry 1	3	4.5			v		v							
33250152	Mathematical Chemistry	3	4.5			v		v							
33250332	Occupational Safety and Security Lab	2	4.5			v						v			
	Total CP	**21**	**31.5**												
Semester 2															
33250513	Basic Chemistry 2	3	4.5			v		v							
33250891	Practicum of Basic Chemistry	2	3.0			v		v					v		
33250671	Chemical Thermodynamics	3	4.5			v			v						
33250004	Organic chemistry	4	6.0			v			v						
30055053	Atomic Structure and Structure of Inorganic Compounds	3	4.5			v			v						

Course code	Course Name	CP	ECTS	PLO											
				1	2	3	4	5	6	7	8	9	10	11	12
33250903	Environmental Education	2	3.0			v						v			
00052033	Religion	2	3.0	v											
00051112	Civic education	2	3.0	v	v	v									
	Total CP	**21**	**31.5**												
Semester 3															
33250933	Qualitative and Quantitative Chemical Analysis	3	4.5			v			v						
33250222	Practicum of Qualitative and Quantitative Chemical Chemistry	2	3.0			v			v				v		
33250263	Chemical Kinetics	3	4.5			v			v						
	Organic compound Reaction	4	6.0			v			v						
33250002	Practicum of Organic chemistry	2	3.0			v			v				v		
33250803	Basics of Inorganic Reactions	2	3.0			v			v				v		
33250343	Structure and Function of Biomolecules	3	4.5			v			v						
00053222	Big data and programming	2	3.0	v	v	v									
	Total CP	**21**	**31.5**												
Semester 4															
33250233	Separation Chemistry	3	4.5			v			v						
33250001	Practicum of Physical chemistry	1	1.5			v			v				v		
33250393	Biomolecular Metabolism	3	4.5			v			v						
	metal and non-metal chemistry	2	3.0			v			v						
33250024	Bioscience	4	6.0			v				v					
33250054	Material chemistry	4	6.0			v				v					
33250132	Practicum of Biochemistry	2	3.0			v			v				v		
00053202	logic and scientific reasoning	2	3.0	v	v	v									
	Total CP	**21**	**31.5**												
Semester 5															
33250333	Instrumental Chemical Analysis	3	4.5			v					v			v	
33250292	Practicum of Instrumental Chemical Analysis & Separation	2	3.0			v					v		v		
33250093	Quantum chemistry	3	4.5			v			v						
33250153	Material characterization method	3	4.5			v					v			v	
33250103	Molecular Structure Elucidation	3	4.5			v					v			v	
33250162	Practicum of Inorganic chemistry	2	3.0			v			v				v		
33250133	Transition Metals and Coordination Chemistry	3	3.0			v			v						
	Total CP	**19**	**28.5**												
Semester 6															
33250003	Research Methodology & Statistics	3	4.5			v			v		v			v	v
33250632	Chemistry Seminar	2	3.0			v			v		v				
33250192	Entrepreneurship	2	3.0												
33250783	Molecule Spectroscopy	3	4.5			v			v						
00053182	Introduction to education	2	3.0	v	v										
	Total Elective courses	4	6			v			v		v	v	v	v	v
	Total CP	**18**	**27**												
Semester 7															
30052072	Pre-Thesis Seminar	2	3		v	v			v	v	v		v	v	v
	MBKM	20	33		v	v			v	v	v		v	v	v
	Total CP	**22**	**33**												
Semester 8															
30054024	Bachelor Thesis	4	6			v	v		v	v	v		v	v	v
	Total CP	**4**	6												
	Elective courses														
33250442	Secondary metabolite chemistry	2	3			v				v					
33251062	Food chemistry	2	3			v				v					
33250562	Polymer Chemistry	2	3			v				v					

Course code	Course Name	CP	ECTS	PLO											
				1	2	3	4	5	6	7	8	9	10	11	12
33250462	Synthesis Organic Chemistry	2	3			v				v					
33250982	Biotechnology	2	3			v				v					
33250961	Environmental Chemistry Practicum	1	1.5			v				v					
33251053	Applied Electrochemistry	3	4.5			v				v					
33250742	Synthesis and Characterization of nanomaterials	2	3			v				v					
33251042	Determination of the structure of natural compounds	2	3			v					v	v			
33250362	Nanoscience and Nanomaterial	2	3			v				v					
33250422	Surface Chemistry	2	3			v				v					
33250553	Microbiology	3	4.5			v				v					
33250412	Bioinorganic	2	3			v				v					
33250572	Solid Chemistry	2	3			v				v					
33250822	Industrial inorganic chemistry	2	3			v				v	v				
33251102	current issues organic chemistry	2	3			v				v					
33250872	Material Chemistry	2	3			v				v					
33251112	STEM (Science, Technology, Engineering, and Mathematics)	2	3			v				v			v	v	v
33250102	Capita Selecta chemistry	2	3			v				v					
33251022	Interenship	2	3	v	v	v	v						v	v	v
KM-00292	Community Service Programme	2	3	v	v	v	v	v	v	v	v	v	v	v	v
33250482	Chemistry learning	2	3												
33250492	chemical management	2	3			v						v			
33250322	industrial, analytical chemistry	2	3			v				v					
MBKM (20 credits)															
Option 1 Research Internship															
KM-01001	Field practice	6	9		v	v				v	v	v	v	v	v
KM-01003	professional ethics	3	4.5		v	v									
KM-01003	Creativity and innovation	3	4.5		v	v									
KM-01002	Communication skills	2	3		v	v									
KM-00993	Problem-solving and decision making	3	4.5		v	v									v
KM-01023	Information and digital literacy	3	4.5									v			v
Total		**20**	**30**												
Option 2 Industrial Internship															
KM-01001	Field practice	6	9		v	v				v	v	v	v	v	v
KM-01003	professional ethics	3	4.5		v	v									
KM-01003	Creativity and innovation	3	4.5		v	v									
KM-01002	Communication skills	2	3		v	v									
KM-00993	Problem-solving and decision making	3	4.5		v	v									v
KM-01023	Information and digital literacy	3	4.5									v			v
Total		**20**	**30**												
Option 3 teaching assistant															
	Teaching Planning	3	4.5												
	Teaching methodology	4	6												
	Teaching practice	6	9												
	Evaluation of teaching activities	4	6												
	Reports and Dissemination of Teaching Results	3	4.5												
Total		**20**	**30**												
Option 4 Entrepreneurship															
	Social entrepreneurship	3	4.5												
	business ethics	2	3												
	Introduction to Management and business	2	3												

Course code	Course Name	CP	ECTS	PLO											
				1	2	3	4	5	6	7	8	9	10	11	12
	Digital marketing	3	4.5												
	Businessman: 1. Entrepreneurial design and presentation 2. business practice 3. Entrepreneurship activity report	10	15												
Total		**20**	**30**												
Option 5: Student Exchange **Option 6: Building a Village** **Option 7: Humanitarian Project** **Option 8: Independent Project**															
	Project Planning and Design	3	4.5												
	Project Management	4	6												
	Project implementation	6	9												
	Project Data Analysis	4	6												
	Report and Dissemination of Project Results	3	4.5												
Total		**20**	**30**												

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

The PEO was developed based on vision and mission in developing graduates who are qualified as chemistry educators, novice researchers, and entrepreneurs. The programme provides the opportunity for graduates to be able to:

1. have educational qualifications, creative, adaptive, competitive, and lifelong learning character.

2. be professionals with attitudes, work ethics, responsibility, leadership, communication skills, and can work individually and collaborate in groups

3. argue scientifically to solve career, community, nation, and global problems.

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcome
Social Competence	PLO 1	Be able to apply religious attitudes, responsibility, leadership, communication skills, professionalism, and work individually and collaborate in groups.
	PLO 2	Be able to apply logical, critical, systematic, innovative thinking, and collaborative skills to build networks, self-development, and argue scientifically to solve career, community, nation, and global. problems
Specialist competences	PLO 3	Able to integrate mathematical and basic concepts of science to solve problems in chemistry
	PLO 4	Be able to understand theoretical concepts, such as organic chemistry, biochemistry, analytical chemistry, physical chemistry, inorganic chemistry.
	PLO 5	Be able to integrate chemical concepts, pedagogical chemistry knowledge, curriculum, methodology, classroom management, media, assessment, and evaluation.

Area	Code	Programme Learning Outcome
	PLO 6	Be able to apply the basics of the scientific method and academic integrity in research and scientific works.
	PLO 7	Be able to design and apply chemistry learning based on technological pedagogical content knowledge (TPACK).
	PLO 8	Be able to plan, manage, and evaluate activities in the laboratory by considering the principles of HSE (Health Safety and Environment).
	PLO 9	Be able to identify problems, determine alternative solutions based on research theory and findings, and design and implement them in chemical education research.
	PLO 10	Be able to apply entrepreneurial values as the basis for simple business design in chemistry education or other relevant fields.
	PLO 11	Be able to apply fundamental skills in managing educational institutions innovatively and adaptively.

The following curriculum is presented:

Course code	Course Name	CP	ECTS	PLO										
				1	2	3	4	5	6	7	8	9	10	11
Semester 1														
00051142	Indonesian	2	3.0	v										
00051122	Pancasila	2	3.0	v	v									
00053074	Basis of Education	3	4.5		v									
33150023	Basic Chemistry I	3	4.5	v		v								
30055043	Basic Physics	2	3.0	v		v								
32251012	Practicum of basic Physics	1	1.5	v		v					v			
33154031	General Biology	2	3.0	v		v								
33154062	Practicum of General Biology	1	1.5	v		v					v			
33154071	Mathematics Chemistry	3	4.5	v		v								
33150842	Olymphism	1	1.5		v									
	Total CP	**20**	**30**											
Semester 2														
33150192	Introduction to Education	2	3.0	v	v									
00052242	Religion	2	3.0	v										
00052152	Learners Development	2	3.0	v				v						
00051062	Citizenship	2	3.0	v	v									
33151542	Planning and Learning Management	2	3.0	v	v			v						
33150033	Basic Chemistry II	3	4.5	v		v								
33150252	Practicum of Basic Chemistry	2	3.0	v		v					v			
33150953	Entrepreneurship	3	4.5	v	v								v	
33150312	HSE (Health Safety and Environment) Laboratory	2	3.0	v	v						v			
	Total CP	**20**	**33**											
Semester 3														
33150002	Big Data and Programming	2	3.0		v				v	v				
00052142	Teaching and Learning Theory	2	3.0	v				v		v				
30055053	Atomic structure and structure of inorganic compounds	3	4.5	v			v							
33151324	Organic Chemistry	4	6.0	v			v							
33150933	Chemical Thermodynamics	3	4.5	v			v							
33150893	Qualitative and Quantitative Analysis Chemistry	3	4.5	v			v							
33154212	Practicum of Qualitative and Quantitative Analysis Chemistry	2	3.0	v			v				v			
	Total CP	**19**	**31.5**											
Semester 4														
33150232	Logic and Scientific Reasoning	2	3.0		v				v					
33154263	Chemistry Curriculum	3	4.5		v			v						v
30052012	Learning Methodology	2	3.0		v			v				v		
30055082	Basics of Inorganic Reactions	2	3.0	v			v							
33150983	Chemical Kinetics Reaction	3	4.5	v			v							
33150993	Chemical Separation	3	4.5	v			v				v			
33151453	Research methodology	3	4.5		v				v			v		
33150172	Practicum of organic chemistry	2	3.0	v			v				v			

Course code	Course Name	CP	ECTS	PLO										
				1	2	3	4	5	6	7	8	9	10	11
	Total CP	**20**	33											
Semester 5														
33150663	Assessment and Evaluation	3	4.5		v			v				v		
33150353	Metal and Non-Metal Chemistry	3	4.5	v			v							
33150682	Practicum of Inorganic Chemistry	2	3.0	v			v				v			
33150303	Quantum Mechanics	3	4.5	v			v							
33150343	Structure and Function of Biomolecules	3	4.5	v			v							
33154083	Statistics	3	4.5		v				v			v		
33150041	Practicum of Physical Chemistry	1	1.5	v			v				v			
33150874	Organic Compound Reaction	4	6.0	v			v							
	Total CP	**22**	**33**											
Semester 6														
33151192	Microteaching	2	3.0	v				v		v				
33154182	Transition Metals and Complex Compounds	2	3.0	v			v							
33150333	Instrumental Chemistry	3	4.5	v			v							
33150372	Practicum of Chemistry Instruments and Separation	2	3.0	v			v				v			
33151093	Biomolecular Metabolism	3	4.5	v			v							
33150292	Practicum of Biochemistry	2	3.0	v			v				v			
33150632	Chemistry Education Seminar	2	3.0		v		v	v	v	v		v		
	Elective Course	4	3.0		v		v	v		v			v	v
	Total CP	**20**	**30**											
Semester 7														
MBKM														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055036	Practice Teaching Skills	6	9.0	v			v	v		v	v			v
	University/Compulsory&Elective Courses/MBKM	12	18.0											
	Total CP	**20**	**30**											
Semester 8														
30054024	Thesis	4	6.0		v		v	v	v	v		v		
	Total CP	**4**	**6.0**											
	Total Credits	**145**	**217.5**											
Elective Courses														
33154143	Environmental education	3	4.5		v						v			
33154092	Learning Media	2	3.0		v			v		v				
30050042	English	2	3.0	v	v									
33154322	Green Chemistry	2	3.0	v			v							
33150012	Medical Biochemistry	2	3.0	v			v							
33150462	Biotechnology	2	3.0	v			v							
33151482	Chemicals of Natural Product	2	3.5	v			v							
33151492	Elucidation Molecular Structure	2	3.0	v			v							
33250362	Nanoscience and Nanotechnology	2	3.0	v			v							
33150282	Polymer Chemistry	2	3.0	v			v							
33150272	Environmental Chemistry	2	3.0	v			v							
33151332	History of Chemistry and Chemistry Education	2	3.0		v			v		v				
33151342	Science Learning	2	3.0	v		v		v						
33151392	Science Technology Engineering Mathematics (STEM)	2	3.0		v			v		v				

Course code	Course Name	CP	ECTS	PLO									
				1	2	3	4	5	6	7	8	9	10	11
33154202	Computer	2	3.0		v			v						
33151422	Ethnopedology	2	3.0	v	v			v		v				
33151432	Chemistry for Children with Special Needs	2	3.0	v	v			v		v				
33151452	Qualitative Research Methodology	2	3.0		v				v					
33154302	Learning Environment	2	3.0		v				v					
33154272	Misconceptions in Chemistry Learning	2	3.0		v			v		v				
33154312	Instrument Development	2	3.0		v			v	v	v				
33151442	ICT in Learning Chemistry	2	3.0		v			v		v				
33151402	Important Concepts in Chemistry	2	3.0		v			v		v				
3151382	School Management	2	3.0	v	v			v		v				
MBKM (20 credits) *														
Option 1														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055036	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	University Courses	12												
Option 2														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055036	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	Elective Courses	12												
Option 3														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055036	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	MBKM (8 programme)	12												

****Options for MBKM Program**

Option1

Code	COURSE	CREDIT
30052072	PreThesis Seminar	2
30055036	Practice Teaching Skills	6
KM-01924	Instrument Development	4
KM-00944	Learning Media Development	4
KM-00934	Teaching Resources Development	4
Total		20

Option 2

Code	COURSE	CREDIT
30052072	PreThesis Seminar	2
30055036	Practice Teaching Skills	6
33154272	Misconceptions in Chemistry Learning*	2
33154312	Instrument Development*	2
33151442	ICT in Learning Chemistry*	2
33150462	Biotechnology*	2
33151382	School Management*	2
33154322	Green Chemistry*	2
Total		20

* Example of elective courses

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

The PEO was developed based on vision and mission in developing graduates of Master of Chemistry Education programme who possess high academic capabilities, social competence, innovation, creativity, competitiveness, and motivation for lifelong learning to become educators, professional researchers, and educational managers, who can:

1. have in-depth knowledge of Technological Pedagogical Content Knowledge (TPACK) and apply the concept of green chemistry to the chemistry learning process.

2. Teach at high school and university level with good attitudes, work ethics, responsibility, leadership, communication skills, and professionalism.

3. Have a competitive advantage in global competition and have social competence.

4. Have a critical understanding of solving educational problems and communicate and collaborate in groups.

Programme Learning Outcomes (PLO):

Area	Code	Programme Learning Outcome
Social Competence	PLO1	Be able to respect humanity's values, morals, and ethics and entirely understand them as educators as well as life-long learners.
	PLO 2	Be able to apply logical, critical, systematic, innovative thinking, and collaborate for developing or implementing practical and applicative science and technology in society based on his subject of study.
Specialist competences	PLO 3	Be able to design and conduct scientific research with a multidisciplinary or interdisciplinary approach to solve problems in chemistry education.
	PLO 4	Be able to analyze main theoretical concepts, such as organic chemistry, biochemistry, analytical chemistry, physical chemistry, inorganic chemistry, and applications in secondary school and higher education.

Area	Code	Programme Learning Outcome
	PLO 5	Be able to apply pedagogical concepts (classic or modern education theory, behavioristic, cognitive, humanistic, and constructivism) in chemistry learning.
	PLO 6	Be able to design and develop chemistry learning activities that are active, creative, effective, and fun by applying several approaches, strategies, methods, and media related to students' characteristics, learning materials, and learning goals led to the TPACK approach.
	PLO 7	Be able to develop and evaluate chemistry laboratory experiments at the secondary and university levels.
	PLO 8	Be able to write and present scientific reports based on research data effectively and publish the research result in a reputable publication.

The following curriculum is presented:

Course Code	Course Name	Cu	Ects	Plo							
				1	2	3	4	5	6	7	8
Semester 1											
30061013	Philosophy Of Science	3	7.8	V	V		V				
30062023	Educational Research Methodology	3	7.8		V					V	V
33361113	Chemistry Learning, Analysis, And Its Application	3	7.8		V		V	V	V		
33361032	Ict In Chemistry Learning	2	5.2		V		V	V	V		
33363014	Current Issues In Chemistry Education	4	10.4		V	V	V			V	
	Total Cu	12	31.2								
Semester 2											
33363103	Educational Statistics	3	7.8		V					V	V
33362013	Chemistry Learning Design	3	7.8		V		V	V			
33362023	Chemistry Learning Evaluation	3	7.8		V			V	V		
33363063	Misconceptions In Chemistry	3	7.8		V			V		V	V
33361042	New Orientation In Education	2	5.2	V	V			V			
33361122	Academic Writing	2	5.2		V			V		V	V
33363103	Educational Statistics	3	7.8		V					V	V
	Total Cu	**18**	**46.8**								
Semester 3											
33361082	Fundamental Concepts In Biochemistry And Organic Chemistry	2	5.2		V	V		V	V		
33361092	Fundamental Concepts In Physical And Inorganic Chemistry	2	5.2		V	V		V	V		
33361102	Fundamental Concepts In Analytical And Environmental Chemistry	2	5.2		V	V		V	V		
33363082	Seminar On Thesis Proposal	2	5.2		V	V	V	V	V	V	
33361062	Green Chemistry	2	5.2		V	V		V	V		
33363052	Applied Chemistry	2	5.2		V	V		V	V		
	Total Cp	**12**	**31.2**								
Semester 4											
33363006	Thesis	6	15.6	V	V	V	V	V	V	V	V
	Total Cp	**6**	**15.6**								
	Total Credits	**49**	**127.4**								