# ASIIN Seal

# Accreditation Report

**Bachelor's Degree Programmes**
***Biology***
***Chemistry Education***
***Geography***

Provided by
**Universitas Negeri Makassar, Indonesia**

Version: 23 June 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: A (2020-2025) | 10 |
| Program Studi Sarjana Pendidikan Kimia | Undergraduate programme in Chemistry Education | ASIIN | BAN-PT: A (2020-2025) | 09 |
| Program Studi Sarjana Geografi | Undergraduate programme in Geography | ASIIN | BAN-PT: A (2016-2021) | 11 |
| **Date of the contract:**.16.02.2021<br>**Submission of the final version of the self-assessment report:** 28.09.2021<br>**Date of the audit (online):** 18.01. – 20.01.2022 | | | | |
| **Peer panel:**<br>Prof. Dr. Ralf Erdmann, Ruhr-University Bochum<br>Sabine Huck, Ministry for the Environment, Nature Conservation, and Nuclear Safety<br>Prof. Dr. Angelika Loidl-Stahlhofen, Westphalian University of Applied Sciences, Recklinghausen<br>Prof. Dr. Mark Vetter, University of Applied Sciences Würzburg-Schweinfurt<br>Ray Steven, Institut Teknologi Bandung, student | | | | |
| **Representative of the ASIIN headquarter:**<br>Rainer Arnold | | | | |
| **Responsible decision-making committee:** | | | | |

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 09 – Chemistry; TC 10 – Life Sciences; TC 11 – Geosciences

| | |
|---|---|
| Accreditation Commission for Degree Programmes | |
| **Criteria used:**<br><br>European Standards and Guidelines as of 15.05.2015<br><br>ASIIN General Criteria as of 28.03.2014<br><br>Subject-Specific Criteria of Technical Committee 09 – Chemistry, Pharmacy as of 29.03.2019<br><br>Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019<br><br>Subject-Specific Criteria of Technical Committee 11 – Geosciences as of 09.12.2011 | |

# 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 CSU / 212.04 ECTS | 1965, Once a year (August) |
| Undergraduate programme in Chemistry Education | Sarjana Pendidikan/ Bachelor of Education in Chemistry | - | 6 | Full time | no | 8 Semester | 144 CSU / 216 ECTS | 1997, Once a year (August) |
| Undergraduate programme in Geography | Sarjana Sains/ Bachelor of Science in Geography | | 6 | Full time | no | 8 Semester | 144 CSU / 216 ECTS | 1997, Once a year (August) |

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

For the Bachelor's degree programme Biology (BSP), Universitas Negeri Makassar (UNM) has presented the following profile in the Self-Assessment Report:

**"Vision:**

The vision of the Biology Study Program is to become an excellent study program by 2025 in the development, study, research of biology and entrepreneur skills that utilizes natural materials in biological processes.

**Mission:**

1. Carry out learning, study, development and research in the field of biology that utilizes natural materials in order to create human beings who believe and fear God Almighty, are qualified and professional and are able to act as agents of development reformers in the midst of society.
2. Carry out learning that directs the potential of biology students to have an entrepreneurial spirit, making it possible to become agents of reform in economic development.
3. Carry out coaching for students to master technology related to the field of biological sciences, as well as master English in scientific/international communication, in addition to Indonesian as the national language.
4. Fostering biological people who have a high commitment to achieve achievements, have a high work ethic, never give up, and serve the interests of the nation and state based on Pancasila and the 1945 Constitution.
5. Creating a conducive and learning atmosphere accompanied by the application of democratic management and leadership.
6. Fostering students who are responsive and excel in the development and study of biology, are ethical, have noble character and have a national perspective."

For the Bachelor's degree programme Chemistry Education (CESP), Universitas Negeri Makassar (UNM) has presented the following profile in the Self-Assessment Report:

"**Vision**

The Chemistry Education Study Program has a vision that is in line with the vision of the University (UNM), namely as a centre for education, study, and development of science education in the field of chemistry with educational and entrepreneurial perspectives.

**Mission**

Produce professional human resources in the field of chemical education.
Creating a conducive academic climate and culture for students majoring in chemistry.

Providing services to the wider community to improve the quality of life for the community, nation and state.
Developing the chemistry department as the spearhead in developing UNM into a teaching and research University.

For the Bachelor's degree programme Geography (GSP), Universitas Negeri Makassar (UNM) has presented the following profile in the Self-Assessment Report:

**"Vision**

The Geography Study Program of the Faculty of Mathematics and Natural Sciences UNM as a centre for the development of science and technology in the field of Geography which has an international standard and has an entrepreneurial perspective and is able to provide benefits for sustainable development in order to improve the welfare of mankind.

**Mission**

1. Prepare professional geography graduates, able to use survey technology and natural resource mapping, national and international competitiveness and entrepreneurial spirit;
2. Organizing research and development activities in geography to support sustainable development;
3. Organizing community service programs that provide solutions to environmental and natural resource problems;
4. Organizing public services based on geography; and
5. Build a network of cooperation nationally and internationally.

**Aim**

1. To make geography graduates who have noble character, have high personality integrity, are professional, able to use survey technology and natural resource mapping, have national and international competitiveness and have an ecopreneurship spirit;
2. Produce and develop research to solve environmental and natural resource problems;
3. Develop community service programs that provide solutions to environmental and natural resource problems;
4. Realizing geographic science-based governance and public services that are effective, efficient, accountable and transparent; and
5. Develop national and international cooperation networks.

# 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 Reports
- Study plans of the degree programmes
- Module descriptions
- Webpage Ba Biology: http://sainsbiologi.fmipa.unm.ac.id/
- Webpage Ba Chemistry Education: http://pendkimia.fmipa.unm.ac.id/
- Webpage Ba Geography: http://geografi-sains.fmipa.unm.ac.id/
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**
The auditors base their assessment of the learning outcomes as provided in the Self-Assessment Reports of the three Bachelor's degree programmes under review.

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

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

life learning and work effectively, both individually and in a team, to demonstrate scientific, critical, and innovative attitude in laboratory works and environmental care.

The BSP programme is designed to produce competitive graduates with competences to work in different biological areas such as various agricultural industries, universities, research institutes, and governmental institutions. As research assistants, graduates should be able to examine issues in biology 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 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 Education (CESP), as defined by UNM, correspond with the competences as outlined by the SSC. They come to the following conclusions:

CESP graduates 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. 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 and have knowledge of 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 CESP graduates will find a suitable occupation as high school teachers, managers of educational institutions, junior researchers, or entrepreneurs.

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

In the GSP programme, the intended learning outcomes include becoming familiar with the historical development of geography and understanding its importance and its key concepts and principles. Graduates should be able to recognize, illustrate, and describe interactions of natural and social matters by using geospatial descriptions and technology. They

should also be able to define characteristics, roles and interdependence of the components of geographical layers and be able to explain the spatial dependence of geographical environment and socio-economic phenomena. In addition, students should learn about research methods by observing, measuring, preparing, and using samples, collections and learning aids. Moreover, graduates should be able to explain the geographical order of natural and social matters and phenomena, and their causes within various territorial spheres, and draw their own conclusions. Finally, they should be familiar with natural and social problems, and be able to explain the influencing factors, causes and consequences based on the principles of sustainable development.

Graduates of the GSP programme can work professionally in various fields of geography such as universities, research institutes, NGO's, private companies and governmental institutions.

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

UNM provides an Objectives-Module Matrix for each programme to verify that the intended learning outcomes of the degree programmes are aligned with the respective SSC.

During the audit, the peers discuss with students, teachers, and alumni where the graduates can find suitable jobs. They learn that Bachelor's graduates from become teachers or work in the area of education, because UNM has a specific focus on educational programmes. In addition, several graduates become civil servants or work for other public institutions, some become entrepreneurs and start their own business, and others find jobs in the industry (e.g. food industry and agricultural sector). In general, the job perspectives are very good and most graduates find a suitable job shortly after graduation.

Between 10 % and 15 % of the Bachelor's graduates from UNM continue their academic education with a Master's degree. UNM also offers postgraduate studies in Biology, Chemistry, and Geography. In some areas, e.g. Biology, even PhD studies are offered.

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

learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences (BSP), the SSC of the Technical Committee 09 – Chemistry, Pharmacy (CESP), and the SSC of the Technical Committee 11 – Geosciences (GSP).

## Criterion 1.2 Name of the degree programme

**Evidence:**

- Self-Assessment Report

**Preliminary assessment and analysis of the peers:**
UNM awards a Bachelor of Education (B.Ed.) or Sarjana Pendidikan (S.Pd.) degree to the graduates of the CESP programme and a Bachelor of Science (B.Sc.) or Sarjana Sains to the graduates of the BSP and GSP programmes.

The names of the degree programmes properly reflect the respective focus and content of the undergraduate programmes.

The auditors confirm that the English translation and the original Indonesian names of all three Bachelor's degree programmes correspond with the intended aims and learning outcomes as well as the main course language (Indonesian).

## Criterion 1.3 Curriculum

**Evidence:**

- Study plans of the degree programmes
- Module descriptions
- UNM Academic Guidelines
- Webpage Ba Biology: http://sainsbiologi.fmipa.unm.ac.id/
- Webpage Ba Chemistry Education: http://pendkimia.fmipa.unm.ac.id/
- Webpage Ba Geography: http://geografi-sains.fmipa.unm.ac.id/
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**
All three undergraduate programmes are offered by the Faculty of Mathematics and Natural Sciences (FMIPA) of Universitas Negeri Makassar (UNM).

The Bachelor's degree programmes under review are designed for four years and are offered as full time programmes. In each programme, 144 credit semester units (CSU) need to be achieved by the students (this is equivalent to 216 ECTS points in CESP and GSP and 212.04 ECTS points in BSP).

All undergraduate programmes at UNM 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. Mid and final exams are conducted on Week 8th and Week 16th, respectively. The odd semester starts in August and ends January of the following year, while the even semester last from February to July. In addition, there is an optional summer semester, which is designed for students, who need to make up on missed or failed courses.

The curriculum of each degree programme consists of compulsory and elective courses and is divided in six different areas.

The BSP programme has the following structure:

| Type of Subject | CSU/ECTS |
|---|---|
| Compulsory | 125/184.06 |
| Elective | 13/19.14 |
| Thesis | 6/8.83 |
| Total | 144/212.04 |

The six areas in the BSP programme are:

**M1. General and Personality Knowledge**: These are university requirements that need to be attended by all undergraduate students at UNM. There are four courses in this with 8 CSU: Pancasila, Religion, Bahasa Indonesia, and Civil Education.

**M2. Basic Science:** Basic compulsory courses on the different natural sciences and mathematics are offered in the first two semesters (16 CSU).

**M3. Content Knowledge:** In this area, practical and theoretical courses on different biological subjects (Nutrition and Health, Zoology, Botany, Biochemistry, Genetics, Cell Biology, Microbiology, Evolution, Ecology, Physiology, Pharmacology, Biotechnology, and Bioinformatics ) are offered (88 CSU).

**M4. Other field expertise (multi and interdisciplinary):** This area includes supporting courses in philosophy, English, community service, and the Bachelor's thesis (19 CSU).

**M5. Module of Elective Matter:** The electives aim at deepening the students' knowledge in specific fields of biology (42 CSU). Students usually choose elective courses that relate to their thesis and/or their individual interests.

The focus of the BSP programme is on organismic and agricultural biology, which are the most important Biology fields in Indonesia. On the other hand, the peers are convinced that UNM should put more emphasis on teaching modern areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology. 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, students should also become acquainted with modern analysing techniques e.g. be able to run a PCR or a gel electrophoresis and to do immuno-blotting. For this reason, UNM should enlarge its capacity in these areas so that all students get hands-on experiences with modern biological methods and techniques (see also criterion 4.3).

The CESP programme has the following structure:

| Type of Subject | CSU/ECTS |
|---|---|
| Compulsory | 129/193.5 |
| Elective | 9/13.5 |
| Thesis | 6/9 |
| Total | 144/216 |

The six areas in the CESP programme are:

**M1. General and Personality Knowledge**: These are university requirements that need to be attended by all undergraduate students at UNM. There are four courses in this with 8 CSU: Pancasila, Religion, Bahasa Indonesia, and Civil Education.

**M2. Basic Science:** Basic compulsory courses on the different natural sciences and mathematics are offered in the first two semesters (16 CSU).

**M3. General pedagogical knowledge:** This group of courses is designed to provide an understanding of the basic concepts of education, pedagogics, philosophy, and learning psychology (13 CSU).

**M4. Content Pedagogical Knowledge:** These courses focus on chemistry-specific content that is related to teaching and learning strategies (31 CSU).

**M5. Content Knowledge:** In this area, practical and theoretical courses on the main chemical subjects (physical chemistry, analytical chemistry, inorganic chemistry, organic chemistry, and biochemistry) are offered (72 CSU).

**M6. Other field expertise (multi and interdisciplinary):** This area includes supporting courses in chemistry, pedagogy, community service, and the Bachelor's thesis (17 CSU).

**M7. Module of Elective Matter:** The electives are theoretical courses, which aim at deepening the students' knowledge in specific fields of chemistry and education (24 CSU). Students usually choose elective courses that relate to their thesis and/or their individual interests.

In the CESP programme, an international class and a regular class are offered. The international class includes an additional chemistry-specific English. In addition, teaching and learning in this class is conducting bilingual, which involves teaching academic content in two languages, in Indonesia and English. Graduates of the international class are expected to be able to provide chemistry-instruction in English for high school students.

The GSP programme has the following structure:

| Type of Subject | CSU/ECTS |
|---|---|
| Compulsory | 129/193.5 |
| Elective | 9/13.5 |
| Thesis | 6/9 |
| Total | 144/216 |

The six areas in the GSP programme are:

**M1. General and Personality Knowledge**: These are university requirements that need to be attended by all undergraduate students at UNM. There are four courses in this with 8 CSU: Pancasila, Religion, Bahasa Indonesia, and Civil Education. In addition, there is a "seminar" with 2 CSU.

**M2. Basic Science:** Basic compulsory courses on the different areas of geography, the natural sciences, and mathematics are offered in the first two semesters (31 CSU).

**M3. Physical Geography:** In this area, practical and theoretical courses on physical geography (Meteorology and Climatology, Oceanography, Soil Geography, Mineralogy and Petrology, Agricultural Geography, Geohydrology, and Water Quality) are offered (30 CSU).

**M4. Human Geography:** In this area, practical and theoretical courses on human geography (Economic Geography, Social Geography, Urban and Rural Geography, Development Geography, Politics of Geography, and Demography) are offered (15 CSU).

**M5. Technical Geography:** In this area, practical and theoretical courses on technical geography (GIS, Applied Remote Sensing, Environmental Impact Assessment, Structural and Field Geology, and Geographic Data Analysis) are offered (18 CSU).

**M6. Regional Geography:** In this area, practical and theoretical courses on technical geography (Management of Coastal and Marine Areas, Spatial and Regional Analysis, Regional Geography of Indonesia, Regional Geography of the World, and Land Evaluation) are offered (10 CSU).

**M7. Other field expertise (multi and interdisciplinary):** This area includes supporting courses in entrepreneurship, English, community service, and the Bachelor's thesis (15 CSU).

**M8. Module of Elective Matter:** The electives aim at deepening the students' knowledge in specific fields of geography (46 CSU). Students usually choose elective courses that relate to their thesis and/or their individual interests.

Usually during the last year of studies, students must complete the community service. The peers discuss with the programme coordinators about the content and goal of this course. The programme coordinators explain that community service is compulsory for all Indonesian students. It has a minimum length of eight weeks and often take 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.

Since UNM has the goal to become internationally more visible and wants to further internationalise 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 an international class in each of the educational undergraduate programmes, which are taught bilingual in English and Bahasa Indonesia. Even in the regular classes, English textbooks are used and some presentations are done in English. The peers appreciate the existence of an English taught class in CESP; however, they are convinced

that it would be very useful to offer international classes in the BSP and GSP programmes. 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 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.

**Criterion 1.4 Admission requirements**

**Evidence:**

- Self-Assessment Report
- UNM Academic Regulation
- UNM webpage: https://unm.ac.id/en/
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**
According to the Self-Assessment Reports, admission procedures and policies for new students follow the National Regulation No.2, 2015. The requirements, schedule, registration venue, and selection test are announced on UNM'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 UNM:

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 (50 % of the students at UNM are admitted through this selection system).

2. Joint Entrance Selection of State Universities (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide online test (subjects: mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography). It accounts for 30 % of the admitted students at UNM.

3. New Student Admission Selection (MANDIRI) students are selected based on an online-test (similar to SBMPTN) specifically held by UNM for prospective students that haven not been accepted through SNMPTN or SBMPTN. MANDIRI is carried out twice per year. First

after the results from SNMPTN and the second time after the announcement of the SBMPTN results. (20 % of the students at UNM are admitted through this test).

Based on the number of lecturers, the condition of the facilities and infrastructure, the senate of FMIPA decides the number of intakes, which is subsequently proposed to the university. In recent years, intake numbers for the undergraduate programmes have been between 90 and 129 students in CESP programme, between 41 and 82 in the BSP programme, and between 41 and 48 in the GSP programme.

The number of applicants exceeds the number of available places but the applications have dropped significantly within the last five years. For example, in 2016/17 there were 1252 applications for the CESP programme and only 411 in 2020/21. The situation is similar in the BSP programme, here the number of applications dropped from 990 in 2016/17 to 216 in 2020/21. In the GSP programme, the number of applications dropped from 406 in 2016/17 to 100 in 2020/21.

As the programme coordinators explain, the drop in applications is mostly due to the COVID-19 pandemic. Many people in Indonesia are facing economic problems due to layoffs and large-scale social restrictions (lockdown); so, many parents are unable to send their children to university.

In the CESP programme, an international class (ICP) and a “regular” class are offered. The number of students accepted for ICP and non-ICP classes each year is around 120 students (80 in the regular class and 40 in the international class). ICP students need to have a high score in their English grades at high school and in the different admission tests.

Undergraduate students at UNM have to pay tuition fees. There are seven different levels of student tuitions fees which range from 500 thousand to 5 million IDR (equal to 13 to 308 €) per semester. The level of tuition fees depends on the degree programme, the entrance path, and the students’ parents’ economic and social background. In addition, a tuition waiver scheme is available upon request and the amount depends on the parents’ economic status. More, several grants for students with financial difficulties are available, such as from the government, industries, foundations, and UNM alumni association. Some senior students work as laboratory assistants to earn some money for financing their studies.

The details of the application process at UNM and further information on admissions criteria and deadlines can be found in the National Regulation No. 2, 2015 and the UNM Academic Regulation, 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 three undergraduate programmes under review.

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

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

The peers see that there are some research activities in the degree programme under review and that some Bachelor's students are involved in them. However, the peers still think that it would be very useful to put more emphasis on teaching modern areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology in the BSP programme.

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 Reports
- Study plans of the degree programmes
- Module descriptions
- Webpage Ba Biology: http://sainsbiologi.fmipa.unm.ac.id/
- Webpage Ba Chemistry Education: http://pendkimia.fmipa.unm.ac.id/
- Webpage Ba Geography: http://geografi-sains.fmipa.unm.ac.id/
- Discussions during the audit

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

The curriculum of all four 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 CSU 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 the FMIPA senate.

The curriculum in the first two semesters is very similar for all three undergraduate programmes. Courses in the first two semesters convey basic knowledge of natural sciences, mathematics, education and languages (Indonesian and English). In addition, students need to attend obligatory courses, such as religion and ethics, pancasila and civic education, which are university requirements and need to be attended by all students at UNM. From the third semester on, more subject-specific classes are offered, with a focus on the respective science area (biology, chemistry, geography). In addition, in the CESP programme, several educational courses (Chemistry Teaching and Learning Strategy, Assessment of Chemistry Instruction, Chemistry Curriculum Review, Research Method of Chemistry Education, Microteaching, Teaching Experience, and Chemistry Learning Simulation) are offered. In the third year of studies, advanced concepts in pedagogics (CESP) and the respective science are taught. During the seventh and eighth semester, students must complete the Community Service (4 CSU) and the Bachelor's thesis (6 CSU).

In the Bachelor's degree programme Biology, students are required to complete 144 credit units (CSU), including 131 CSU of compulsory courses and 13 CSU of elective courses. The BSP program collaborates with several institutions to implement practical work, including the Cereal Research Institute in Maros, Bantimurung-bulusaraung National Park in Maros, Veterinary Research Institute in Maros, Plant Protection Research Institute, and Brackish Water Cultivation Research Institute. Every year, there are around 18 students, who take part in practical work in these institutions.

The Bachelor's degree programme Chemistry Education requires students to complete 144 CSU, with 135 CSU of compulsory courses and a minimum of 9 CSU of elective courses.

CESP students have to spend two months in high school in order to become acquainted with practical teaching. The respective course encompasses 4 CSU or 6.06 ECTS.

The Bachelor's degree programme Geography requires students to complete 144 CSU, with 135 CSU of compulsory courses and a minimum of 9 CSU of elective courses.

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 ensures that the intended learning outcomes of the respective degree programme can be achieved.

*International Mobility*

UNM 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 Faculty of Mathematics and Natural Sciences, has established several international collaborations in the field of education and research. This includes agreements with Chiba University, Hiroshima University, Tokyo University of Marine Science and Technology, University of Technology Malaysia, University of Technology Perlis Malaysia, and Université Bretagne Sud France.

The recognition of credits acquired abroad, such as lectures or internships, is regulated by the Ministry of Research and Technology through a programme called the International Credit Transfer System. This rule is followed and applied by all universities in Indonesia, including Universitas Negeri Makassar. The regulation requires that there needs to be a cooperation agreement and students completing courses or internships abroad and applying for credit recognition, need to submit the relevant documents (activity reports, certificates of education/internships, transcript of records, etc.) to the respective committee at UNM. The committee will conduct an evaluation and assessment of the documents submitted by students and then give approval for the course credits to be recognized. Furthermore, the committee will contact the student to convey the approval of the recognised courses and update the student's credit through the university's academic system.

In order to gain international experience, students have the opportunity to carry out Community Service (KKN) and internships (Magang) abroad. Students who want to participate in this programme must have a minimum GPA of 3.00 and good English proficiency (minimum TOEFL score of 430). In recent years, UNM sent students to Malaysia, Thailand, and the Philippines.

Although, some international co-operations exist, the number of Indonesian students spending some time abroad is rather low. To promote academic mobility, UNM has an International Office, where students can get all information about academic mobility. It also offers a website that can be accessed anytime, which provides complete information such as the requirements that students need to know before applying for one of the international programmes. Students confirm that UNM provides opportunities to go abroad; however, the students' academic mobility is very limited despite students' high interest. Only few Bachelor's students are studying abroad for a limited period. The number of available places in the exchange programmes is limited and there are restrictions due to a lack of sufficient financial support.

The auditors 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, offer more places at international schools, and provide more scholarships for students. FMNS should extend the collaboration with international schools, both in Indonesia and in other ASEAN countries.

A good starting point for initiating international co-operations are the personal international contacts of the faculty members. It is also possible for students and teachers to apply to international organisations like ERASMUS or the German Academic Exchange Council (DAAD) for receiving funds for stays abroad.

In summary, the peers appreciate the effort to foster international mobility and support 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 use a credit point system called CSU, which is regulated as follows:

| Type of activity | Definition of 1 CSU/week/semester | Duration (min) | TOTAL (min) |
|---|---|---|---|
| Classroom course | Classroom meeting | 50 | 170 |
| | Structured task | 60 | |
| | Independent work | 60 | |
| Practical course | Practical work | 170 | 170 |
| Seminar | Seminar meeting | 100 | 170 |
| | Independent work | 70 | |

In comparison to ECTS credit system, wherein 1 ECTS credit equals 25-30 hours of students' workload per semester, it is determined that 1 CSU is awarded for 170 minutes of workload per week and the relation between the different kind of learning (contact hours, self-studies) is fixed.

The details and the students' total workload are described in the respective module description. In the BSP programme, it is defined that 25 hours of students' workload are required for awarding one ECTS credit. The workload indicates the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study, and examinations) and these are ascribed separately to each component of the curriculum.

The degree programmes should be completed within 8 semesters, where in each semester students usually take 18 - 20 credits. Outstanding students, who have a GPA above 3.5, can take up to 24 credits per semester. This regulation gives students the opportunity to finishing their studies in 7 semesters.

Since the workload of the students was only estimated by the programme coordinators, the peers suggest re-evaluating the calculation of ECTS points and involve the students in verifying the workload of each module, especially the time needed for self-studies. This could e.g. be done by including a respective question in the course questionnaires. By European standards, 30 ECTS points should be awarded per semester. By correctly displaying students' workload in ECTS points, UNM would facilitate academic mobility and better support their graduates if they apply for international programmes.

In any case, UNM needs to verify the students' total workload and make sure that the actual workload and the awarded ECTS points correspond with each other. This information should be made transparent in the module descriptions and the study plans.

According to the Self-Assessment Reports, most of the undergraduate students at the Faculty of Mathematics and Natural Sciences can complete their degree without exceeding the

expected period. For example in BSP, only around 5 % of the students leave the programme without graduation (mostly for personal and financial reasons) and the average length of studies was 4.3 years (from 2015/16 to 2019/20). The numbers are similar for the other undergraduate programmes. In CESP, the drop-out-rate is around 5 % and the average length of studies was 4.3 years. The average length of studies in GSP was 4.7 years in the last five years, while between 1 and 27 students left the programme per year.

The programmes coordinators emphasise, that drop out students are those who withdraw from the programme before completing the program at their own request due to several reasons, not because they fail to complete their studies within the maximum period set by the program. The following reasons why students leave the programme are mentioned: they are accepted at other universities/schools, they accept a job offer, or they face financial or health problems.

In summary, the peers confirm that all three undergraduate programmes have a high but manageable workload.

**Criterion 2.3 Teaching methodology**

**Evidence:**

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

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

Various teaching and learning methods (including lectures, computer training, teaching etc.) have been implemented. In addition, students are introduced to the scientific approach (5e learning cycle, inquiry based learning, etc.). Structured activities include homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership. The assignments and exercises should help students to develop their abilities with respect to critical thinking, written/oral communication, data acquisition, problem solving, and presentations.

Students are further encouraged to apply their knowledge in a series of student projects that are oriented towards teaching practice in the classroom and in laboratories. Classes

and laboratories are designed in problem-based learning settings in order to introduce student-oriented teaching methods to involve all students in the learning process and to develop their thinking and analytical skills. In addition, internships in schools as practice-based learning are also part of the curriculum.

The most common method of learning is class session, with several courses having integrated laboratory practices. Lecturers generally prepare presentations to aid the teaching process. 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.

To help students achieving the intended learning outcomes and to facilitate adequate learning and teaching methods, UNM uses a Moodle-based e-learning platform called Syam-OK where students and teachers can interact. This includes blended learning methods by combining face-to-face activities and independent student learning activities. In face-to-face activities, the lecturer will guide students on how to use teaching materials, animation, videos, assignments, and evaluation. Students will learn independently by utilizing teaching materials that the lecturer has previously posted.

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

**Criterion 2.4 Support and assistance**

**Evidence:**

- Self-Assessment Report
- UNM Academic Regulation
- Discussions during the audit

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

The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. Mentoring activities should be carried out in an interactive and collaborative manner by conducting periodic meetings. 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. When necessary, the academic advisor can schedule additional meetings. On the other hand, each student can ask for personal guidance when problems or questions come up.

The students confirm during the discussion with the peers that they all have an academic advisor who 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 Bachelor's thesis have one or more supervisors, who are selected based on the topic of the thesis. One supervisor could be an external supervisor, if the student performs the thesis outside UNM. The role of the thesis supervisor is to guide students in accomplishing their final project, e.g. to finish their research and complete the written report.

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

Students facing mental health problems, e.g. due to high work load and the fear to fail any classes, can get professional help from the university medical center.

Finally, there are several student organizations at UNM; 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 good mentoring by the teachers is an important criterion of success. 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 understand the national regulations in Indonesia about SKS and workload calculation and do not ask UNM to change that system. Nevertheless, in an international accreditation procedure done by European standards, it is important that the students' total workload is verified for each course and that the respective procedure follows the ECTS Users' Guide.

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 Report
- Module descriptions
- UNM Academic Regulation

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

According to the Self-Assessment Reports, the students' academic performance is evaluated based on their attendance and participation in class, their laboratory works and reports, assignments, homework, presentations, mid-term exam, and the final exam at the end of each semester. The form and length of each exam is mentioned in the module descriptions that are available to the students via UNM's homepage and the digital platform SIA (Sistem Informasi Akademik). Usually, there are two written exams in each course (besides the assignments, homework, and presentations); the mid-term exam is conducted in the 8th week of the semester and the final exam in the 16th week.

As stated in the Academic Guidelines, the assessment of students' performance usually consists of 30 % for the midterm exam, 40% for the final exam, 10 % for structured assignments, 10 % for independent assignments, and 10% for participation/activity. Participation and assignments records are managed by each teacher, while mid-term and final exams are managed by the study programme. The grading system is different for the teaching internships, 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 Academic Regulations.

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, multiple-choice tests, essays, problem-solving or case-based questions, and calculation problems. Some lecturers also give multiple choice or true-false questions in examinations or quizzes. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams. Students are informed about mid-term and final exams via the Academic Calendar. Students can access their results via UNM's digital platform SIA.

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.

Every student in the three undergraduate programmes under review is required to do a final project (Bachelor's thesis). This project is conducted independently under the guidance of one or more supervisors and usually consists of literature study, practical research, and data analysis. Both the student and his /her supervisors might decide the topic and content of the project. In many cases, the lecturers offer particular topics connected to their research. The closing undergraduate thesis presentation can be carried out if the student already has a publication related to her/his thesis in a national journal.

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. Students have to design a research proposal (this proposal is developed in the "seminar course", which usually takes place in the seventh semester) with a time schedule for the project, which is discussed with the academic advisor. If they agree, the students apply formally for being allowed to work on the suggested topic.

Universitas Negeri Makassar through the Chancellor's Regulation has stipulated that every undergraduate student must publish the results of their thesis research in a national journal. In order to graduate, this paper needs to be at least at submission stage. As the programme coordinators explain, this policy is carried out with the aim of training students' skills in writing and publishing scientific papers. This skill is considered very important because it can help the students when they want to continue their studies to the master's level because some universities, especially overseas ones, require their prospective students to have publication experience. According to the programme coordinators, this policy will not extend the student's study period because the activities of writing scientific publications by students are carried out from the beginning of thesis writing and are intensively guided by the supervisors.

If a student fails, 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. Students must attend at least 80 % of the total course sessions (16 lectures) in one semester to take part at the final exam. Students who cannot attend the course due to sickness or other conditions with acceptable reasons can still take the exam.

According to the Academic Regulations, students have to leave the university at the end of the third semester if they achieve a GPA below 2.00 out of at least 30 credits. In addition, the have to resign if they do not complete their studies within 7 years or have committed a criminal act and/or have violated the provisions as stipulated in the Academic Regulations.

The students appreciate that there are several short exams instead of one big exam and confirm that the exam load is appropriate and they are well informed about the examination schedule, the examination form, and the rules for grading.

The peers also inspect a sample of 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 UNM will put more emphasis on using exams relating to transfer skill and critical thinking. They point out that this is especially relevant for mid-term and final exams and that students should not only learn facts by heart and that this should be reflected in the exams.

The peers consider criterion 3 to be mostly fulfilled.

# 4. Resources

**Criterion 4.1 Staff**

**Evidence:**

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

**Preliminary assessment and analysis of the peers:**
At UNM, 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 teaching staff in the CESP programme currently consist of 22 permanent academic staff members, including 3 full professors, 11 associate and assistant professors, and 8 lecturers. The teachers are assisted by 5 technicians and 3 administrative staff members. Of the academic staff members, 40.9 % hold a Master's degree and 59.1 % a PhD. In 2020, there were 544 students in the CESP programme, which results in a teacher to student ratio of 1 to 25.

71.4 % of the academic staff members in the BSP programme hold a Ph.D degree and 28.6 % a Master's degree. In total, there are 14 academic staff members (3 full professors, 6 associate professors, and 5 lecturers) in the BSP programme. In addition, there are 18 supportive staff members (technicians, administrative staff, librarians etc.) in the Department of Biology. In 2021, there were 165 students in the BSP programme, this results in a teacher to students ratio of 1 to 12.

In the GSP programme, there are 20 academic staff members (2 full professors, 7 associate professors, 6 assistant professors, and 5 lecturers.) 11 academic staff members have a PhD, and 9 have a Master's degree. In addition, there are 6 laboratory assistants and 1 technician who are responsible for the fundamental laboratory practise. The current number of GSP students is 218, which results in a teacher to student ratio of 1 to 11.

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.

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

During the audit, the peers inquire how high the teaching load is and if are there enough opportunities for the academic staff members to conduct research activities. They learn that teachers at FMIPA have a workload of 12 to 16 credits, so that teachers have enough time for all their activities including research.

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

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

### Criterion 4.2 Staff development

**Evidence:**

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

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

UNM encourages training of its academic and technical staff for improving the educational abilities and teaching methods. Lecturers are provided with pedagogical training and professional development programmes such as PEKERTI (Instructional Technique Basic Skill

Training), particularly for junior lecturers, and Applied Approach (AA), which 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, as well as syllabus and course content development. All teachers at UNM are obligated to attend the lecturer certification programme held by the Directorate General of Higher Education (Direktorat Jenderal Pendidikan Tinggi, DIKTI). An official teaching certificate is issued after the faculty member has completed the certification process.

The office of the Vice-Rector facilitates those programs together with the Educational Development and Quality Assurance Institute. This office also provides training for e-learning and for designing teaching materials.

The further development of academic staff members should also be achieved through degree and non-degree trainings in Indonesian universities and abroad. Lecturers can join doctoral programmes based on their research interests. Furthermore, the department/faculty support their lecturers to join English scientific/preparation classes (IELTS, TOEFL) and to apply for doctoral programmes. As young staff members with a Master's degree are encouraged to pursue doctoral studies (usually abroad), UNM provides foreign language training and organises seminars presenting scholarships from various sources.

In addition, senior teachers are required to mentor and train the newly recruited staff members in the following aspects: teaching, research activities, journal publication, and community service. The junior staff members have to assist the senior teachers as a sit-in lecturer for a minimum of one semester.

As described in the Self-Assessment Report, staff members can attend training courses to enhance their professional skills. This includes workshops or seminars for laboratory staff, seminars to improve library services, safety workshops, and administration workshops.

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 UNM and FMIPA provide funds for joining international conferences. Teachers can apply for financial support for their international activities by submitting a proposal to UNM and FMIPA. 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 UNM, their opportunities to further improving their didactic abilities and to spending some time abroad to attend conferences, workshops or seminars.

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

### Criterion 4.3 Funds and equipment

**Evidence:**

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

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

Basic funding of the undergraduate programmes and the facilities is provided by UNM 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 UNM or the Indonesian government (Bantuan Pendanaan Perguruan Tinggi Nasional, BPPTN), but the teachers have to apply for them. There are some co-operations with the industry and the private sector, but most important are the funds from the government (approximately 60 %) and the tuition fees (approximately 40 %).

The academic staff members emphasise that from their point of view, all three undergraduate programmes under review receive sufficient funding for teaching and learning activities. In general, they are satisfied with the technical support. The students confirm this positive impression and state their satisfaction with the available resources.

In advance of the audit, the peer group received videos showing some of the laboratories at the Faculty of Mathematics and Natural Sciences. They notice that there are no severe bottlenecks due to missing equipment or a lacking infrastructure. The technical equipment for teaching the students on a Bachelor's level is available. 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, usually in context of their Bachelor's thesis. The students also express their satisfaction with the library and the available scientific literature there.

Nevertheless, the peers cannot make a final assessment of the quality of the technical equipment and the infrastructure on the basis of the videos and the discussions alone. Only some laboratories are shown in the videos and especially the scope and design of the safety standards and how they are followed by the students in the laboratories 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, gloves, ventilation system (quantitative information such as air exchange rates achieved both in the overall lab and in the fume hood would be required), fume hoods, etc.). For this reason, the peers point out that it is necessary to assess the technical infrastructure, safety measures, and facilities onsite at UNM. A team of at least one expert together with an ASIIN programme manager should visit FMIPA in order to confirm that the infrastructure, the technical equipment and the safety measures meet the required standards.

Moreover, the peers emphasise that all students need to have the opportunity to get hands on experience with modern practical techniques and with carrying out laboratory experiments. For this reason, the number of students conducting one experiment should be reduced. In order to gain sufficient practical experience in the laboratories, groups conducting one experiment should be limited to 2 to 3 students.

With respect to practical laboratory work in biology, the peers emphasise students should also become familiar with modern analysing techniques e.g. be able to run PCR and electrophoresis, get cloning and chromatography experience and to do immuno-blotting. For this reason, UNM should enlarge its capacity in these areas and purchase the require technical equipment (e.g. micropipettes, UV-Vis photometers, sets for electrophoresis and immune-blotting, columns for protein purification, light microscopes, PCR machines, software to plan cloning experiments, centrifuges, one autoclave per lab, incubation chambers, shaking & heating devices, and clean benches. The goal must be to give all students hands-on experiences with modern biological methods and techniques.

The situation is similar in chemistry. Here, additional safety should be installed in the laboratories and students should learn how to analyse inorganic compounds (not only theoretically), to do some chromatographic experiments, to plan and conduct synthesis and purification of organic compounds or to extract and purify aromatic substances or vitamins from natural products, and to interpret data sets of instrumental analytics (IR, UV, MS, NMR).

In geography, GIS is a weak point, but form the peers' point of view, the available computer equipment and software licenses are sufficient.

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 do not doubt that the laboratory equipment and facilities as well as safety standards in laboratories are sufficient to carry out the necessary practical work. However, they cannot deduce from the videos and the discussions alone, if there is room for improvement. For this reason, they still think that is it necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at UNM.

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: http://sainsbiologi.fmipa.unm.ac.id/
- Webpage Ba Chemistry Education: http://pendkimia.fmipa.unm.ac.id/
- Webpage Ba Geography: http://geografi-sains.fmipa.unm.ac.id/

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

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

After studying the module descriptions, the peers confirm that they include almost all necessary information about the persons responsible for each module, the teaching methods and work load, the awarded credit points, the intended learning outcomes, the content, the applicability, the admission and examination requirements, and the forms of assessment.

However, the peers notice that not all module descriptions (especially in CESP and GSP) mention the students' total workload and how many ECTS points (30h per ECTS point) are awarded, or the conversion between workload and ECTS points is not done correctly.

### Criterion 5.2 Diploma and Diploma Supplement

**Evidence:**

- Self-Assessment Reports
- Sample Transcript of Records for each degree programme
- Sample Diploma Supplement for each degree programme

**Preliminary assessment and analysis of the peers:**
The peers confirm that the students of all three degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Diploma Supplement contains all required information about the degree programme. The Transcript of Records lists all the courses that the graduate has completed, the achieved credits, grades, and cumulative GPA.

### Criterion 5.3 Relevant rules

**Evidence:**

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

**Preliminary assessment and analysis of the peers:**
The auditors confirm that the rights and duties of both UNM 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.

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

UNM does not comment on this criterion in its statement.

The peers consider criterion 5 to be mostly fulfilled.

# 6. Quality management: quality assessment and development

**Evidence:**

- Self-Assessment Report
- UNM Academic Regulation
- Discussions during the audit

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

The curriculum and the intended learning outcomes of each programme are evaluated at least every five years, and if necessary, the curriculum is adjusted to accommodate the demands of the working world. The process involves the advisory board, Department Heads, Dean and Vice Dean), teaching staff, students, and alumni.

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

The internal process involves units at three management levels, i.e. university level, faculty level and programme level. The quality assurance system at university level is run by the Quality Assurance Centre (PPM), which coordinates the Quality Assurance Units (UPM) at faculty level. At each department, there is a Quality Assurance Group (GPM), which is responsible for quality assurance at programme level.

PPM is the unit responsible directly to the Rector with the main role is to perform the QA process on university level. PPM is responsible for the continuous improvement of degree programmes through monitoring, assessing and analysing the educational processes. To this end, PPM prepares the guidelines and quality standards for all degree programmes and conducts internal curriculum audits. In addition, PPM also conducts different customer satisfaction surveys.

At the faculty level, the quality assurance process is organized by the Quality Assurance Unit (UPM). The UPM is working directly under the respective Dean. Its role is to ensure the quality of educational processes and research activities in each degree programme. The main role of UPM is to implement academic standards and guidelines at faculty level in accordance with the quality standards developed by PPM.

The quality assurance at programme level is primarily conducted by the Programme Coordinator and by Quality Assurance Group (GPM). One of UPM's duties is to monitor the implementation of the curriculum at programme level. In addition, the Programme Coordinator and UPM have the task to assess if the programme learning outcomes and course outcomes have been achieved. Every year, the Quality Assurance Groups submit a report on the educational processes including recommendations how to improve the quality of the respective degree programme.

Internal evaluation of the quality of the degree programmes is mainly provided through student and alumni surveys. Students give their feedback on the courses through online questionnaires (EDOM) at the end of each semester. Students assess various aspects such as students' understanding, lecturer's responsiveness, course delivery, lecturer's proficiency, explanation of course objective, and references in each enrolled course. Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on UNM's digital platform. The Department Head and Dean can access the students' feedback and responses to each course and each teacher can see the average score of the students' feedback. If there is negative feedback, the Dean writes a letter to the respective teacher, analyses the problem, and offers guidance. Students are informed about the results at the end of the semester, by either announcements or digital messages.

In addition, each department regularly conducts an alumni tracer study. By taking part at this survey, alumni can comment on their educational experiences at UNM, the waiting period for employment after graduation, their professional career and can give suggestions how to improve the programme. Furthermore, there is the Career Development Centre (CDC) at UNM, which offers help to find suitable internships, announces job vacancies organises courses to develop soft skills. During the audit, the employers express their general satisfaction with the qualification profile of the graduates. They just recommend further improving the students' English skills, which would give them even better opportunities on the job market.

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

The peers acknowledge that students are involved at all levels. There is the Student Executive Board (BEM) at university and faculty level, while at department and programme level there are the Study Programme Student Association (HMPS) and the Department Student Association (HMJ).

The University-level Student Executive Board (BEM-U) represents students at university level for extracurricular activities on and off campus and coordinates the activities of student organisations in extracurricular activities. The Chairperson of BEM is elected in a general meeting of the UNM Student Council. The Student Executive Board (BEM) FMIPA UNM represents students on faculty level with the approval of the Faculties Student Council (Maperwa). The board provides advice and suggestions to the faculty leaders and coordinates the activities of student organisations in extracurricular activities. HMJ and HMPS have the same tasks on department and programme level. In addition, there are discussions and consultations with students and their input is taken into consideration, but the decisions are made by the UNM's management.

The auditors gain the impression that the Departments take the students' feedback seriously and changes are made if necessary. Nevertheless, the peers see that students are not represented in the university's boards and, thus, are not directly involved in the decision-making processes. The peers are convinced that it would be very useful to have student members in the different boards. For this reason, they recommend that student representatives should be members of the boards at UNM (for example the Quality Assurance Group and the Quality Assurance Unit) at least on programme and faculty level and be actively involved in the decision-making processes for further developing the degree programmes.

The peers discuss with the representatives of UNM's partners from public institutions and private companies if there are regular meetings with the partners on faculty or department level, where they discuss the needs and requirements of the employers and possible changes to the degree programmes. They learn that some employers and alumni are invited to give their feedback on the content of the degree programmes in the course of the tracer studies. The peers appreciate that UNM stays in contact with its alumni and has a close relation with its partners from the industry and public institutions. However, no academic advisory board exists. As the peers consider the input of the employers to be very important for the further improvement of the degree programmes, they appreciate the existing culture of quality assurance with the involvement of employer in the quality assurance process. Nevertheless, they recommend establishing an academic advisory board at each department. The advisory board should consist of a group of professionals, employers, and experts of the relevant fields from outside the university (e.g. companies, high schools, and governmental institutions). Including students, professionals, and employers in the different boards will help further developing the degree programmes.

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:**

The peers thank UNM for explaining that UNM has the status of Public Service Agency (Badan Layanan Umum, BLU) which, according to ministry provision, does not allow for makeing students members of the Quality Assurance Group and the Quality Assurance Unit. However, the peers still think that this would be useful and suggest that UNM should address this issue with the Indonesian ministry.

The peers appreciate that UNM will involve external stakeholders (professionals, employers, and experts) of the relevant fields to further develop the degree programmes.

The peers consider criterion 6 to be mostly fulfilled.

# D Additional Documents

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

- none

# E Comment of the Higher Education Institution (14.03.2022)

UNM provides the following statement:

First, we would like to express our thanks and appreciation to the peer panel of ASIIN for their virtual visit to accreditation the Bachelor's Degree Programs in CESP, BSP, and GSP in the Faculty of Mathematics and Natural Science of Universitas Negeri Makassar (UNM). Herewith, our comments regarding peers finding during the audit.

- As referring to the peers suggests to **BSP** program (page 14) that program should enlarge the capacity of modern biology technique area. The Biology Study Program has designed a curriculum that emphasis the students become familiar with those area, therefore we added another supplementation document video about student activities using the modern tolls in the laboratory of Biology.
  http://sainsbiologi.fmipa.unm.ac.id/video-of-laboratory/

  **BSP** has developed a LSM (Laboratory Management System) for more managable work in laboratory:
  https://sipolab.bio.unm.ac.id

  Proving the BSP activities in laboratories, please find the recent research output in the reputable international journal with collaborate with students that work in Biology Laboratory.

  1. Karim, H., Azis, A.A. & Jumadi, O. Antagonistic activity and characterization of indigenous soil isolates of bacteria and fungi against onion wilt incited by Fusarium sp.. Arch Microbiol 204, 68 (2022). https://doi.org/10.1007/s00203-021-02663-2
  2. Ali, A., Kurnia, N., Asrini Nurani Ulfah, A., Damayanti, P., Rante, H. and Jumadi, O., 2021. Diversity of Endophytic Actinomycetes Producing Indole-3-Acetic Acid and In vitro Evaluation of Plant Growth-promoting Activity on Brassica oleracea L. TROPICAL AGRICULTURAL SCIENCE. http://www.pertanika.upm.edu.my/resources/files/Pertanika%20PAPERS/JTAS%20Vol.%2044%20(2)%20May.%202021/02%20JTAS-2036-2020.pdf
  3. Hartati, H., Idris, I.S. and Azis, A.A., 2019. Wound Healing Properties of Swietenia Mahagoni Seed Extracted Using Scco2: An In Vitro Study. *Jurnal Teknologi*, *81*(1), pp.119-123. https://journals.utm.my/jurnalteknologi/article/view/12195

4. Pagarra, H., Hartati, H., Ali, A., Salempa, P. and Muharram, M., 2020. Isolation and Optimization of Endophytic Bacteria from Roots of Karst Area Ecosystems Producing Protease Enzymes. *The Journal of Research on the Lepidoptera*, *51*(2), pp.431-439. https://www.lepidopteraresearchfoundation.org/abstract.php?id=201
5. Ahmad, H., Ahmad, M.H., Ali, A., Pagarra, H., Salempa, P., Salleh, L.M. and Passitta, M., 2022. EVALUATION OF ANTIOXIDANT, ANTIMICROBIAL AND WOUND HEALING ACTIVITY OF POIKILOSPERMUM SUAVEOLENS. *Jurnal Teknologi*, *84*(1), pp.41-48. DOI: https://doi.org/10.11113/jurnalteknologi.v84.16858
6. Jumadi, O., Hala, Y., Iriany, R.N. *et al.* Combined effects of nitrification inhibitor and zeolite on greenhouse gas fluxes and corn growth. *Environ Sci Pollut Res* **27,** 2087–2095 (2020). https://doi.org/10.1007/s11356-019-06776-6
7. Jumadi, O., Hartono, H., Masniawati, A. *et al.* Emissions of nitrous oxide and methane from rice field after granulated urea application with nitrification inhibitors and zeolite under different water managements. *Paddy Water Environ* **17,** 715–724 (2019). https://doi.org/10.1007/s10333-019-00724-3

- As per the assessment of the peers regarding workload that suggest re-evaluating of the ECTS point and involve the students in verifying the workload of each module (Page 23). The UNM determine the workload for one credit is equal to 170 minutes per week for a semester refer to the Act Ministry of Education and Culture of the Republic of Indonesia no. 3, article 19 of 2020 about National Standard of Higher Education. In the regulations, the one credit represents approximately 50 minutes spent in a classroom and 120 minutes spent for two additional courses preparation each week that take place out-of-class. The course preparation can represent structured academic activities such as homework or practical course (60 minutes) and individual work (60 minutes). Further, the total student's workload for one semester refers to the Act Ministry of Education and Culture of the Republic of Indonesia no. 3, article 20 of 2020 about the National Standard of Higher Education. This regulation explains that in one semester the total workload for students is a maximum of 24 credits or equal to 36 ECTS. In the three-study program, students enroll the course with 20 credits (30 ECTS) on average every semester.

  We have more emphasis them and workload pointed in revise modules which it can be assessed:

  **CESP** website (*http://pendkimia.fmipa.unm.ac.id/modul/*
  *http://pendkimia.fmipa.unm.ac.id/rencana-pembelajaran-semester-rps/*

**BSP** website http://sainsbiologi.fmipa.unm.ac.id/modul-handbook-2/ and list of ECTS, http://sainsbiologi.fmipa.unm.ac.id/list-of-ects/

**GSP** website http://geografi-sains.fmipa.unm.ac.id/module/

- As per the assessment of the peers regarding the examination type should be relating to transfer skill and critical thinking (Page 28). The three of study programs are developed the exams base on transfer skill and critical thinking, therefore we have re-place the exam types.

  **CESP :** http://pendkimia.fmipa.unm.ac.id/instrument-penilaian/

  **BSP :** http://sainsbiologi.fmipa.unm.ac.id/sample-of-test/

  **GSP :** : https://geografi-sains.fmipa.unm.ac.id/course-hots-questions/

- Referring to the peer findings about the quality of the technical equipment and the infrastructure based on the videos and the discussions alone (Page 33-34). We emphasise that our equipment and facilities as well as safety standard for work in laboratories are sufficient to gain the learning of outcomes and support of higher-level research. Herewith, we made another additional video (new information in detail) and information about our laboratories facilities quality.

  **CESP:** https://pendkimia.fmipa.unm.ac.id/laboratory-facilities/

Herewith, several outcomes of research activities which data obtained from chemistry laboratory where published in journals.

| No | Article's Title | Instrument | Link |
|---|---|---|---|
| 1 | Evaluation Of Antioxidant, Antimicrobial And Wound Healing Activity Of Poikilospermum Suaveolens | Spectrophotometer | https://journals.utm.my/jurnalteknologi/article/view/16858/7798 |
| 2 | Tembelekang Plant (*Lantana camara* linn) Active Compounds Forprevention of Infectious Diseasesinskin-wounds | IR Spectrophotometer, TLC | http://eprints.unm.ac.id/id/eprint/2492 |
| 3 | Biosynthesis of Silver Nanoparticles Made from Green Tea Leaf Extract (*Camellia sinensis*) | Uv-vis | https://www.scientific.net/MSF.967.161 |
| 4 | Immobilization Of Saccharomycess Cereviceae Biomass On Chitosan | IR Spectrophotometer | http://eprints.unm.ac.id/17326/ |

| | | | |
|---|---|---|---|
| | And Its Application As An Adsorbent For Pb(Ii) Ion | | 2/12%20immobiliza-tion%20of%20saccharo-mycess%20cere-viceae.pdf |
| 5 | Isolasi dan Identifikasi Senyawa me-tabolit sekunder ekstrak n-Heksan dari Umbi Lobak (Raphanus Sativus lamk) | IR | https://journal3.uin-alauddin.ac.id/in-dex.php/al-kimia/ar-ticle/view/1570 |
| 6 | The Antibacterial Properties of Bayur Tissuesâ€™ Extract (Pterospermum subpeltatum C.B. Rob) | Uv-vis spectro-photome-ter | https://jour-nals.utm.my/jurnalte-knologi/ar-ticle/view/3210 |
| 7 | Isolasi dan Identifikasi Senyawa Me-tabolit Sekunder Ekstrak Metanol Daun Ketepeng Cina (Cassia Alata Linn) | IR | https://ojs.unm.ac.id/ch emica/article/view/4620 |
| 8 | Biosintesis Partikel-nano Perak Menggunakan Ekstrak Metanol Daun Manggis (Garcinia mangostana L.) | Uv-vis spectro-photome-ter | https://ojs.unm.ac.id/sai nsmat/article/view/1286 |
| 9 | Konsentrasi Nutrien di Saluran Pem-buangan Kota Makassar: Sebuah Surve Awal | Uv-vis spectro-photome-ter | https://ojs.unm.ac.id/sai nsmat/article/view/461 |
| 10 | Uji Stabilitas Pigmen Merah Antosia-nin Dari Daun Jati Muda (Tectona Grandis Linn F) Terhadap Ph Sebagai Pewarna Alami | Uv-vis spectro-photome-ter | https://ojs.unm.ac.id/ch emica/arti-cle/view/13623 |
| 11 | Efektifitas penggunaan Spektronik 20 D+ pada penentuan kadar nitrat air sumur menggunakan metode re-duksi kadmium | spektronik 20 D+ | https://ojs.unm.ac.id/ch emica/ar-ticle/view/26700 |
| 12 | The Analysis Total Phenolic Extract Noni Fruit (Morinda citrifolia L.) as Inhibiting Activity of Bacteria | Uv-vis spectro-photome-ter | https://jurnal.fmipa.unila .ac.id/analit/arti-cle/view/1670 |
| 13 | Pengaruh Ph Terhadap Degradasi Pewarnadirect Blue Menggunakan Jamur Pelapuk Kayu (Pleurotus Fla-bellatus) | Uv-vis spectro-photome-ter | https://www.e-jour-nal.unair.ac.id/JKR/arti-cle/view/6546 |
| 14 | Pengaruh Konsentrasi Asam Sitrat Dan Waktu Demineraliasi Pada Perolehan Gela-tin Dari Tulang Ikan Kakap Merah (Lutjanus Sp.) | IR spectro-photome-ter | http://eprints.unm.ac.id/ 17320/ |

**The BSP:** http://sainsbiologi.fmipa.unm.ac.id/video-of-laboratory/

BSP has developed a LSM (Laboratory Management System) for more managable work in laboratory:
https://sipolab.bio.unm.ac.id

Proving the BSP activities in laboratories, please find the recent research output in the reputable international journal with collaborate with students that work in Biology Laboratory (the list can be see above, page 41).

**GSP :** https://geografi-sains.fmipa.unm.ac.id/laboratory-2/

The detail of GIS system can be seen at 2:07 minutes

Geography Program Study has MoU ESRI product. Educational Academic Departmental Small Term CU/SU Package - 1 Prov. file with 5 masters for 3 Year Period (1 master of ArcGis Pro advanced can be connected by 3 parallel computers at the same time).

**Computer Specifications**

Computer Specifications in Department of GSP is supported by the latest operating systems or service pack tested with adequate hardware requirement.

| | |
|---|---|
| **Operating system** | Windows 10 Enterprise (64 bit) |
| **CPU** | Intel Core i5 7400 |
| **Platform** | X64 |
| **Storage** | 120 GB SSD. 1 TB HDD |
| **Memory/RAM** | 16 GB (8GB X 2) |
| **Graphics Memory** | GPU 8 GB |
| **Screen Resolution** | More than 1024X768 |

**Software Requirements**

The following software was installed and support device for the best student's experience.

| | |
|---|---|
| **.NET Framework** | Microsoft .NET Framework 4.8 or later |
| **ArcGIS Enterprise** | ArcGIS Desktop 10.9.1 with ArcGIS License Manager 2021.0 |
| | ArcGIS Pro Advanced |
| | ArcGIS for Desktop Extensions: 3D Analyst, Data Interoperability, Data Reviewer, Geostatistical Analyst, Network Analyst, Publisher, Schematics, Spatial |

| | |
|---|---|
| | Analyst, Tracking Analyst, Workflow Manager, Image Analyst, ArcGIS LocateXT |
| | ArcGIS Online (ArcGIS Online Service Credits 2.500), ArcGIS Premium Application, & ArcGIS Enterprise AdSpecifically |
| **Software Open Source** | SNAP<br>QGIS<br>Virtual Studio |

GIS Lab of GSP has many successfully outputs and patents in collaboration between lectures, students, and industries in national and international scale. The that can be access in link:

https://geografi-sains.fmipa.unm.ac.id/artikel-dan-produk-laboratorium/

- As per the assessment of the peers regarding module descriptions (especially in CESP and GSP) (page 35). We have revised the modules and added ECTS point (30h per ECTS point) which synchronize to workload.

  **CESP :** http://pendkimia.fmipa.unm.ac.id/modul/
  and
  http://pendkimia.fmipa.unm.ac.id/rencana-pembelajaran-semester-rps/

  **GSP :** http://geografi-sains.fmipa.unm.ac.id/module/

- As per the assessment of the peers regarding student representatives should be members of the boards at UNM (for example the Quality Assurance Group and the Quality Assurance Unit) (page 39). However, UNM has status of Public Service Agency (Badan Layanan Umum, BLU) which according to ministry provision, UNM does not allow the students' representation to be a member of the Quality Assurance Group and the Quality Assurance Unit, yet. However, students' organizations are involved in the design of effective university governance programs. In addition, students are frequently invited to the evaluation process of the program implementation (customer satisfaction survey), particularly for the university development and innovation program. In addition, regarding of peer recommendations about advisor board, UNM will step forward to involve the professionals, employers, and experts of the relevant fields from outside the university to develop the degree programmes.

# F Summary: Peer recommendations (28.03.2022)

Taking into account the additional information and the comments given by UNM, 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 | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |
| Ba Geography | With requirements for one year | - | 30.09.2027 |

## Requirements

**For all degree programmes**

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

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at UNM.

A 3. (ASIIN 5.1) The module descriptions need to include information about students' total workload and how many ECTS points are awarded. The conversion between workload and ECTS credits need to be correct.

## Recommendations

**For all degree programmes**

E 1. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students and to cooperate with more renowned international universities and research institutions.

E 2. (ASIIN 3) It is recommended to put more emphasis in the exams on assessing transfer skills and critical thinking.

E 3. (ASIIN 4.3) It is strongly recommended to make students familiar with modern practical techniques and methods and to provide enough technical equipment so that experiments can be done by groups not larger than 2 to 3 students.

E 4. (ASIIN 6) It is recommended to make students' representatives members of boards at UNM and to directly involve them in the decision making processes for further developing the degree programmes.

E 5. (ASIIN 6) It is recommended to establish advisory boards with external stakeholders on department level.

**For the Bachelor's degree programme Biology**

E 6. (ASIIN 1.3) It is recommended to put more emphasis on teaching modern areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology.

**For the Bachelor's degree programme Chemistry Education**

E 7. (ASIIN 4.3) It is recommended to provide chemistry students with hands-on experience in techniques such as chromatography, synthesis, extraction and enrichment of natural products.

# G Comment of the Technical Committees (13.06.2022)

## Technical Committee 09 – Chemistry, Pharmacy (08.06.2022)

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

The TC discusses the procedure and agrees with the assessment of the peers.

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 | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |
| Ba Geography | With requirements for one year | - | 30.09.2027 |

## Technical Committee 10 – Life Sciences (13.06.2022)

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

The TC discusses the procedure and is of the opinion that the areas of biology mentioned in recommendation E6 belong to the core subjects of a biology degree programme and therefore proposes replacing the term "modern" with "essential" and upgrading the recommendation to a requirement. Otherwise, the TC agrees with the assessment of the peer group.

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 | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |
| Ba Geography | With requirements for one year | - | 30.09.2027 |

**For the Bachelor's degree programme Biology**

A 4. (ASIIN 1.3) It is necessary to put more emphasis on teaching essential areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology.

# Technical Committee 11 – Geosciences (10.06.2022)

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

The TC discusses the procedure and agrees with the proposed requirements and recommendations.

The Technical Committee 11 – Geosciences 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 | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |
| Ba Geography | With requirements for one year | - | 30.09.2027 |

# H Decision of the Accreditation Commission (24.06.2022)

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

The Accreditation Commission discusses the procedure and decide to follow the suggestion of the TC 10 – Life Sciences to change recommendation E6 into a requirement, because subjects such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology are essential part of a biology programme. In addition, the AC decides to upgrade recommendation E7 to a requirement, because chemistry students need to get hands-on experience in techniques such as chromatography, synthesis, extraction and enrichment of natural products. Otherwise, the AC follows the assessment of the peer group and the TCs.

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 | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |
| Ba Geography | With requirements for one year | - | 30.09.2027 |

## Requirements

**For all degree programmes**

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

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at UNM.

A 3. (ASIIN 5.1) The module descriptions need to include information about students' total workload and how many ECTS points are awarded. The conversion between workload and ECTS credits need to be correct.

**For the Bachelor's degree programme Biology**

A 4. (ASIIN 2.1) It is necessary to put more emphasis on teaching essential areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology.

**For the Bachelor's degree programme Chemistry Education**

A 5. (ASIIN 4.3) It is necessary to provide chemistry students with hands-on experience in techniques such as chromatography, synthesis, extraction and enrichment of natural products.

## Recommendations

**For all degree programmes**

E 1. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students and to cooperate with more renowned international universities and research institutions.

E 2. (ASIIN 3) It is recommended to put more emphasis in the exams on assessing transfer skills and critical thinking.

E 3. (ASIIN 4.3) It is strongly recommended to make students familiar with modern practical techniques and methods and to provide enough technical equipment so that experiments can be done by groups not larger than 2 to 3 students.

E 4. (ASIIN 6) It is recommended to make students' representatives members of boards at UNM and to directly involve them in the decision making processes for further developing the degree programmes.

E 5. (ASIIN 6) It is recommended to establish advisory boards with external stakeholders on department level.

# I Fulfilment of Requirements (23.06.2023)

## Analysis of the peers and the Technical Committees (12.06.2023)

### Requirements

**For all degree programmes**

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

| **Initial Treatment** | |
|---|---|
| Peers | **Fulfilled**<br>Vote: unanimous<br>Justification: UNM has verified the students' total workload and adjusted the awarded ECTS points accordingly. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 11 | Fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peers. |

A 2. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at UNM.

| **Initial Treatment** | |
|---|---|
| Peers | **Fulfilled**<br>Vote: unanimous<br>Justification: The online visit of the laboratories was very informative and proved that the university is well equipped for the education of the students.<br>However, safety measures in chemistry labs should be improved. Work with organic solvents has to be done in fume hoods. |
| TC 09 | Fulfilled<br>Vote: unanimous |

| | |
|---|---|
| | Justification: The Technical Committee discusses the process and agrees with the assessment of the experts. A note with respect to the safety measures should be included in the decision letter to the university. |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 11 | Fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peers. |

A 3. (ASIIN 5.1) The module descriptions need to include information about students' total workload and how many ECTS points are awarded. The conversion between workload and ECTS credits need to be correct.

| **Initial Treatment** | |
|---|---|
| Peers | **Fulfilled**<br>Vote: unanimous<br>Justification: For the module description that are available, the requested information has been included. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 11 | Fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peers. |
| AC | Fulfilled/not fulfilled<br>Vote: unanimous/per majority<br>Justification: |

**For the Bachelor's degree programme Biology**

A 4. (ASIIN 2.1) It is necessary to put more emphasis on teaching essential areas of biology such as bioinformatics, immunology, structural biology, molecular biology, and molecular cell biology.

| **Initial Treatment** | |
|---|---|
| Peers | **Fulfilled**<br>Vote: unanimous |

| | |
|---|---|
| | Justification: The university has convincingly addressed this issue by adding most of the requested courses to the compulsory programme. However, they should try to integrate also preparative organic chemistry (chemistry program) and mutagenesis techniques for protein engineering (biology program) in their study programmes. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The Technical Committee discusses the process and agrees with the assessment of the experts. A note with respect to the integration of preparative organic chemistry should be included in the decision letter to the university. |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers. |
| TC 11 | Fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peers. |

**For the Bachelor's degree programme Chemistry Education**

A 5. (ASIIN 4.3) It is necessary to provide chemistry students with hands-on experience in techniques such as chromatography, synthesis, extraction and enrichment of natural products.

| **Initial Treatment** | |
|---|---|
| Peers | **Fulfilled**<br>Vote: unanimous<br>Justification: This aim has been satisfactory addressed by UNM as education in the requested techniques have mostly been included into the curriculum. However students should also be able to perform preparative organic chemistry. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peers. |
| TC 11 | Fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peers. |

# Decision of the Accreditation Commission (23.06.2023)

The AC decides that all requirements are fulfilled.

The Accreditation Commission decides to award the following seals:

| Degree Programme | ASIIN seal | Subject-specific labels | Maximum duration of accreditation |
|---|---|---|---|
| Ba Biology | All requirements fulfilled* | - | 30.09.2027 |
| Ba Chemistry Education | All requirements fulfilled* | - | 30.09.2027 |
| Ba Geography | All requirements fulfilled | - | 30.09.2027 |

*Indication in the decision letter:

Safety measures in chemistry labs should be improved. Work with organic solvents has to be done in fume hoods.

# 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:

**Attitudes**

[1] A-LO1: Be devoted to God the Almighty and have a social sensitivity to society and the environment

[2] A-LO2: Demonstrate a responsible, law-abiding, disciplined, entrepreneurial spirit, high commitment, sincere and independent in their field of expertise and able to interact nationally and globally

[3] A-LO3: Upholding human values, nationalism, law, moral and ethical values.

**General Skills**

[1] GS-LO1: Able to apply logical, critical, systematic and innovative thinking by utilizing information technology to produce solutions embodied in scientific documents, able to implement areas of biological expertise with integrity, able to develop networks of work adapting, creating, contributing, evaluating, and able to take decisions on independent work and groups to apply science to community life.

**Specific Skills**

[1] SS-LO1: Able to solve science and technology problems, present alternative solutions and be able to make decisions in the field of management, and able to benefit biological resources through the principles of systematic organizing, predicting, analyzing information data and biological materials sera modulating the structure and function of cells (organizing principle,

predicting, analyzing and modulating),as well as the application of relevant technologies

**Knowledge**

[1] K-LO1: Mastering the concepts of molecular biology theory, organismal biology, ecology and evolution

[2] K-LO2: Mastering the concepts, principles and applications of biotechnological knowledge in the fields of food, health, environment, biological resources in the management and utilization of biological and environmental resources

[3] K-LO3: Master basic principles and applications of statistics, *software* for the analysis and synthesis of biological resources in specific environments.

The following **curriculum** is presented:

**Table C1-9. Structure of Curriculum at Study Program of Biology**

| Semester | Code Course | Course Name | Credite | Biology Core | Institution Core | Module | Unit/Departments Responsible |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| I | 19A42C101 | Pancasila | 2 | | √ | √ | MKU Unit |
| | 19A42C102 | English | 2 | | √ | √ | English Department |
| | 19A42C103 | General Biology | 3(1) | √ | | √ | Biology Department |
| | 19A42C104 | Basic physics | 3(1) | √ | | √ | Physic Department |
| | 19A42C105 | Basic Mathematics | 3 | √ | | √ | Mathematic Department |
| | 19A42C106 | Basic Chemistry | 3(1) | √ | | √ | Chemistry Department |
| | 19A42C107 | Environmental Science Education | 2 | √ | | √ | Geography Department |
| | 19A42C108 | Basic Statistics | 2 | √ | | √ | Statistics Department |
| | | **Credite Total** | **20** | | | | |
| II | 19A42C201 | Religion Education | 2 | | √ | √ | MKU Unit |
| | 19A42C202 | Civil Education | 2 | | √ | √ | MKU Unit |
| | 19A42C203 | Indonesian | 2 | | √ | √ | Indonesia Languange Department |
| | 19A42C204 | Science Philosophy | 2 | | √ | √ | MKU Unit |
| | 19A42C205 | Science of Nutrition and Health | 3 | √ | | √ | Biology Department |
| | 19A42C206 | Plant Morphology | 3(1) | √ | | √ | Biology Department |
| | 19A42C207 | Animal Structure | 3(1) | √ | | √ | Biology Department |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 19A42C208 | Biochemistry | 3(1) | √ | | √ | Biology Department |
| | | **Credite Total** | **20** | | | | |
| III | 19A42C301 | Genetics | 3(1) | √ | | √ | Biology Department |
| | 19A42C302 | Natural Material Chemistry | 3(1) | √ | | √ | Biology Department |
| | 19A42C303 | Invertebrate Zoology | 3(1) | √ | | √ | Biology Department |
| | 19A42C304 | Plant Anatomy | 3(1) | √ | | √ | Biology Department |
| | 19A42C305 | Cell Biology | 3(1) | √ | | √ | Biology Department |
| | 19A42C306 | Lower Plant Botany | 3(1) | √ | | √ | Biology Department |
| | 19A42C307 | Organic Chemistry | 2 | √ | | √ | Chemistry Department |
| | | **Credite Total** | **20** | | | | |
| IV | 19A42C401 | Higher Plant Botany | 3(1) | √ | | √ | Biology Department |
| | 19A42C402 | Vertebrate Zoology | 3(1) | √ | | √ | Biology Department |
| | 19A42C403 | Plant Physiology | 3(1) | √ | | √ | Biology Department |
| | 19A42C404 | Animal Physiology | 3(1) | √ | | √ | Biology Department |
| | 19A42C405 | Microbiology | 3(1) | √ | | √ | Biology Department |
| | 19A42C406 | Evolution | 2 | √ | | √ | Biology Department |
| | 19A42C407 | Conservation Biology | 3(1) | √ | | √ | Biology Department |
| | 19A42C408 | Genetics Molecular | 2 | √ | | √ | |
| | | **Credite Total** | **22** | | | | |
| V | 19A42C501 | Plant Ecology | **3(1)** | √ | | √ | Biology Department |
| | 19A42C502 | Tissue Culture | **3(1)** | √ | | √ | Biology Department |
| | 19A42C503 | Physiology Microbe | **3(1)** | √ | | √ | Biology Department |
| | 19A42C504 | Animal Development | **3(1)** | √ | | √ | Biology Department |
| | 19A42C505 | Aquatic Ecology | **3(1)** | √ | | √ | Biology Department |
| | 19A42C506 | Research Methodology | **3** | √ | | √ | Biology Department |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Elective courses | 12 | | | √ | Biology Department |
| | | **Credite Total** | **18** | | | | |
| VI | 19A42C601 | Pharmacology | 2 | √ | | √ | Biology Department |
| | 19A42C602 | Animal Ecology | 3(1) | √ | | √ | Biology Department |
| | 19A42C603 | Experimental Design | 2 | √ | | √ | Biology Department |
| | 19A42C604 | Environmental Impact Analysis | 2 | √ | | √ | Biology Department |
| | 19A42C605 | Biotechnology | 3(1) | √ | | √ | Biology Department |
| | 19A42C606 | Bioinformatics | 2 | √ | | √ | Biology Department |
| | 19A42C607 | Biology Seminar | 2 | √ | | √ | Biology Department |
| | 19A42C608 | Basic Entrepreneurship | 2 | √ | | √ | Biology Department |
| | | Elective courses | 11 | | | | Biology Department |
| | | **Credite Total** | **18** | | | | |
| VII | 19A42C701 | Practical Work | 3 | | √ | √ | Biology Department |
| | 19A42C702 | Community Services | 4 | | √ | √ | UNM Service Commuinity |
| | | Elective courses | 11 | | | | Biology Department |
| | | **Credite Total** | **6** | | | | |
| VIII | 19A42C801 | Final Project | 6 | | √ | √ | Biology Department |
| | | Elective courses | 8 | | | | Biology Department |
| **Credite Total** | | | **6** | | | | |
| **Total credite of course** | | | **145** | | | | |

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:

**Attitudes**

A-LO1 contribute to improving the quality of life in society, nation, and state.
A-LO2 respect the diversity of cultures, views, religions, and beliefs, as well as the original opinions or findings of others.
A-LO3 commit to preserve the environment and local wisdom.

**Generic Skills**

G-LO1 able to apply logical, critical, systematic, and innovative thinking, and able to work with others responsibly as well as independently.
G-LO2 apply the information and communication technology (ICT) in written report and oral presentation.
G-LO3 able to prepare a written report and present reports orally in Indonesian and in English.

**Specific Skills**

S-LO1 apply theoretical concepts about educational theory, student development, pedagogic knowledge of chemistry to develop learning methodologies, curriculum and learning evaluation.

S-LO2 able to plan, implement and evaluate chemistry experiments using local resources and consider aspects of work safety and security.

S-LO3 apply the principles of Occupational Safety and Security in managing the laboratory and in using chemical instruments.

**Knowledge**

K-LO1. Able to apply the fundamentals of Mathematics and Natural Sciences in learning a more advance subjects, particularly in chemistry.

K-LO2. Able to analyze, synthesize, and solve problems in daily life that correlate to the concepts in the main subjects of chemistry: inorganic, organic, biochemistry, physical and analytical chemistry.
K-LO3. Able to develop simple and sustainable methods to synthesize materials using local bioresources by applying the concepts in applied chemistry subjects.
K-LO4 able to look for and to follow-up business opportunities.

The following **curriculum** is presented

**Table C1-7. Structure of Curriculum Chemistry Education Program**

| Semester | Course Code | Courses Name | Credits | Chemistry Core | Institution Core | Module | Unit/ Responsible Departments |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| I | 16A33C101 | Basic Mathematic | 3 | | ✓ | 2 | Mathematic Department |
| | 16A33C102 | Basic Physic | 3 | | ✓ | 2 | Physic Department |
| | 16A33C103 | Basic Chemistry | 3 | ✓ | | 2 | Chemistry Department |
| | 16A33C204 | Basic Biology | 2 | | ✓ | 2 | Biology Department |
| | 16A33C105 | Basic Statistic | 3 | ✓ | | 2 | Chemistry Department |
| | 16A33C106 | Environmental Education | 2 | | ✓ | 2 | Geography Department |
| | 16A33C107 | Pancasila | 2 | | ✓ | 1 | MKU Unit |
| | 16A33C108 | English for Chemistry | 2 | ✓ | | 6 | Chemistry Department |
| | | **Total Credits** | **20** | | | | |
| II | 16A33C201 | Islam Study | 2 | | ✓ | 1 | MKU Unit |
| | | Protestant Study | 2 | | ✓ | 1 | |
| | | Catholic Study | 2 | | ✓ | 1 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Hindu Study | 2 | | ✓ | 1 | |
| | | Buddha Study | 2 | | ✓ | 1 | |
| | 16A33C202 | Civic Education | 2 | | ✓ | 1 | MKU Unit |
| | 16A33C203 | Indonesian | 2 | | ✓ | 1 | Indonesia Language Department |
| | 16A33C204 | Advance of Basic Chemistry | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C205 | Chemistry Laboratory Management | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C206 | Organic Chemistry I | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C207 | Experiment of Organic Chemistry I | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C208 | Mathematical Chemistry | 2 | ✓ | | 6 | Chemistry Department |
| | 16A33C209 | Inorganic Chemistry | 2 | ✓ | | 5 | Chemistry Department |
| | | **Total Credits** | **20** | | | | |
| **III** | 16A33C301 | Analytical chemistry I | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C302 | Experimental of Analytical Chemistry I | 1 | ✓ | | 5 | Chemistry Department |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16A33C303 | Physical Chemistry I | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C304 | Philosophy of Science | 2 | ✓ | | 3 | Chemistry Department |
| | 16A33C305 | Inorganic Chemistry II | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C306 | Organic Chemistry II | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C307 | Experiment of Organic Chemistry II | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C308 | Basic Science Education | 2 | ✓ | | 3 | Chemistry Department |
| | 16A33C309 | Chemistry Library | 2 | ✓ | | 6 | Chemistry Department |
| | 16A33C310 | Introduction of Education | 2 | ✓ | | 3 | Chemistry Department |
| | | **Total Credits** | **22** | | | | |
| **IV** | 16A33C401 | Analytical Chemistry II | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C402 | Experiment of Analytical Chemistry II | 1 | ✓ | | 5 | Chemistry Department |
| | 16A33C403 | Physical Chemistry II | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C404 | Experiment of Inorganic Chemistry | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C405 | Physical Inorganic Chemistry | 2 | ✓ | | 5 | Chemistry Department |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16A33C406 | Organic Chemistry III | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C407 | Experiment of Physical Chemistry I | 1 | ✓ | | 5 | Chemistry Department |
| | 16A33C408 | Biochemistry | 3 | ✓ | | 5 | Chemistry Department |
| | 16A33C409 | Teaching Profession | 2 | ✓ | | 3 | Chemistry Department |
| | 16A33C410 | Student Psychology Development | 2 | ✓ | | 3 | Chemistry Department |
| | 16A33C411 | Chemical Bonding | 2 | ✓ | | 5 | Chemistry Department |
| | | **Total Credits** | **23** | | | | |
| **V** | 16A33C501 | Instrument of Analytical Chemistry | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C502 | Experiment of Instrumental Analytical Chemistry | 1 | ✓ | | 5 | Chemistry Department |
| | 16A33C503 | Experiment of Biochemistry | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C504 | Experiment of Physical Chemistry II | 1 | ✓ | | 5 | Chemistry Department |
| | 16A33C505 | Nuclear and Radiochemistry | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C506 | Food Chemistry | 3 | ✓ | | 5 | Chemistry Department |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 16A33C507 | Learning and Teaching | 3 | ✓ | | 3 | Chemistry Department |
| | 16A33C508 | Chemistry Teaching and Learning Strategy | 3 | ✓ | | 4 | Chemistry Department |
| | 16A33C509 | Chemistry Instruction Planning | 3 | ✓ | | 4 | Chemistry Department |
| | 16A33C510 | Assessment of Chemistry Instruction | 3 | ✓ | | 4 | Chemistry Department |
| | | **Total Credits** | **23** | | | | |
| **VI** | 16A33C601 | Environmental Chemistry | 2 | ✓ | | 5 | Chemistry Department |
| | 16A33C602 | Chemistry Curriculum Review | 3 | ✓ | | 4 | Chemistry Department |
| | 16A33C603 | Research Method of Chemistry Education | 3 | ✓ | | 4 | Chemistry Department |
| | 16A33C604 | Microteaching *) | 2 | ✓ | | 4 | Chemistry Department |
| | 16A33C605 | Seminar of Chemistry Education *) | 2 | ✓ | | 4 | Chemistry Department |
| | 16A33C606 | Entrepreneurship | 2 | ✓ | | 6 | Chemistry Department |
| | | Elective Courses | 12 | ✓ | | 4,6 | Chemistry Department |
| | | **Total Credits** | **26** | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **VII** | 16A33C701 | Teaching Experience *) | 4 | ✓ | | 4 | Chemistry Department |
| | 16A31C702 | Community Experience *) | 3 | | ✓ | 6 | UNM Service Community |
| | | Elective Courses | 12 | ✓ | | 4,6 | Chemistry Department |
| | | **Total Credits** | **19** | | | | |
| **VIII** | 16A31C801 | Thesis *) | 6 | ✓ | | 6 | Chemistry Department |
| **Total Credits** | | | **6** | | | | |
| **Total Credits of Course** | | | **144** | | | | |

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

**Attitudes**

[1] A-LO1: Be devoted to God the Almighty and able to show religious attitudes.
[2] A-LO2: Upholding human values in carrying out duties based on religion, morals, and ethics.
[3] A-LO3: Contributes to improving the quality of life in society, nation, state, and advancement of civilization based on Pancasila.
[4] A-LO4: Citizens who are proud and love the country have nationalism and a sense of responsibility to the state and nation.
[5] A-LO5: Respects the diversity of cultures, views, religions, and beliefs, and the original opinions or findings of others.
[6] A-LO6: Works together and has social sensitivity and care for the community and the environment.
[7] A-LO7: Obeys the law and discipline in social and state life.

[8] A-LO8: Internalizes academic values, norms, and ethics.
[9] A-LO9: Demonstrate an attitude of responsibility for work in their field of expertise independently
[10] A-LO10: Internalize the spirit of independence, perseverance, and entrepreneurship
[11] A-LO11: Sincere and committed to developing students' attitudes, values, and abilities based on the importance of local wisdom and noble morals and having the motivation to act for the benefit of students and society in general.
[12] A-LO12: Have a mind to engage in lifelong learning

**General Skills**

[1] GS-LO1: Able to apply science and technology through scientific reasoning, logical, critical, and innovative thinking.GS-LO2 Able to carry out knowledge and or technology studies in geography based on scientific principles compiled in the form of a thesis/final report.
[2] GS-LO3: Able to publish final project results that the public can access
[3] GS-LO4: Able to communicate information and ideas through various media to the public by geographic fields.
[4] GS-LO5: Develop and manage a small business or entrepreneurship.
[5] GS-LO6: Capable to complete tasks and developing new ideas, both independently and in the team, including preparing and presenting reports, orally and in writing in Indonesian and English

**Specific Skills**

[1] S-LO1: Able to collect, process, and analyze data to produce spatial data using GIS.
[2] S-LO2: Able to interpret objects in aerial photographs and satellite imagery.
[3] S-LO3: Able to use geographic concepts, principles, and approaches in solving physical and social environmental problems.
[4] S-LO4: Able to process, verify, and validate resource balance data.
[5] S-LO5: Able to analyze land resource balance.
[6] S-LO6: Able to analyze mineral and mining resource balance.
[7] S-LO7: Able to analyze forest resource balance.
[8] S-LO8: Able to analyze human resource balance and community socio-economic data.

[9] S-LO9: Able to analyze the balance of regional facilities and infrastructure resources.
[10] S-LO10: Able to analyze water resources balance.
[11] S-LO11: Able to analyze weather and climate data for development purposes.

**Knowledge**

[1] K-LO1: Has knowledge of Basic Mathematics, Basic Physics, Basic Chemistry, Introduction Environment.
[2] K-LO2: Know social and geography
[3] K-LO3: Know the principles of making maps based on Geographic Information Systems using ArcGis, MapInfo, Erdas Imagine, and ErMapper software.
[4] K-LO4: Knows geographic concepts, principles, and approaches.
[5] K-LO5: Knows about environmental development planning.
[6] K-LO6: Knows planning and researching the field of regional resources, both bio-geophysical and socio-economic.
[1] K-LO7: Proficient with essential knowledge, research methodology, and scientific writing

The following curriculum is presented:

**Table C1-13. Structure of Curriculum at Study Program of Geography**

| Semester | Code Course | Course Name | Credite | Geography Core | Institute Core | Module | Unit/Departments Responsible |
|---|---|---|---|---|---|---|---|
| 1 | 19A52C101 | Calculus | 2 | | | √ | Mathematics Department |
| | 19A52C102 | Basic Physic | 2 | | | √ | Physic Department |
| | 19A52C103 | Basic Biology | 3 | | | √ | Biology Department |
| | 19A52C104 | Basic Chemistry | 3 | | | √ | Chemistry Department |
| | 19A52C105 | Environmental Education | 2 | | | √ | Geography Department |
| | 19A52C106 | Basic Statistic | 2 | | | √ | Statisic Department |
| | 19A52C107 | Basic Geology | 2 | √ | | √ | Geography Department |
| | 19A52C108 | Basic Hydrology | 2 | √ | | √ | Geography Department |
| | 19A52C109 | Pancasila | 2 | | √ | √ | MKU Unit |
| **Credite Total** | | | **20** | | | | |
| 2 | 19A52C201 | English | 2 | | √ | √ | English Department |
| | 19A52C202 | Religion Education | 2 | | √ | √ | MKU Unit |
| | 19A52C207 | Civic | 2 | | √ | √ | MKU Unit |
| | 19A52C208 | Basic Geomorphology | 2 | √ | | √ | Geography Department |
| | 19A52C209 | Introduction and Philosophy of Geography | 3 | √ | | √ | Geography Department |
| | 19A52C210 | Meteorology and Climatology | 2 | √ | | √ | Geography Department |
| | 19A52C211 | Resources of Geography | 2 | √ | | √ | Geography Department |
| | 19A52C212 | Basic Cartography | 2 | √ | | √ | Geography Department |
| | 19A52C213 | Demographics | 3 | √ | | √ | Geography Department |
| **Credite Total** | | | **20** | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | 19A52C301 | Basic Remote Sensing | 2 | √ | | √ | Geography Department |
| | 19A52C302 | Intruduction Sociology | 2 | √ | | √ | Geography Department |
| | 19A52C303 | Geography Economy | 2 | √ | | √ | Geography Department |
| | 19A52C304 | Oceanography | 2 | √ | | √ | Geography Department |
| | 19A52C305 | Soil Geography | 2 | √ | | √ | Geography Department |
| | 19A52C306 | Biogeography | 2 | √ | | √ | Geography Department |
| | 19A52C307 | Geology of Indonesian | 2 | √ | | √ | Geography Department |
| | 19A52C308 | Geomorphology of Indonesian | 2 | √ | | √ | Geography Department |
| | 19A52C309 | Map Usage | 2 | √ | | √ | Geography Department |
| | | Elective Courses | 2 | √ | | √ | Geography Department |
| **Credite Total** | | | **20** | | | | |
| 4 | 19A52C401 | Research and Methodology of Geography | 2 | √ | | √ | Geography Department |
| | 19A52C402 | Geographic Data Analysis | 2 | √ | | √ | Geography Department |
| | 19A52C403 | KKL 1 | 2 | √ | | √ | Geography Department |
| | 19A52C404 | Hydrometerology | 2 | √ | | √ | Geography Department |
| | 19A52C405 | Management of Coastal and Marine Areas | 2 | √ | | √ | Geography Department |
| | 19A52C406 | Development Geography | 2 | √ | | √ | Geography Department |
| | 19A52C407 | Regional and Spatial Analysis | 2 | √ | | √ | Geography Department |
| | 19A52C412 | Project Management | 2 | √ | | √ | Geography Department |
| | | Elective Courses | 10 | √ | | √ | Geography Department |
| **Credite Total** | | | **26** | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | 19A52C501 | Regional Geography of Indonesia | 2 | √ | | √ | Geography Department |
| | 19A52C502 | Minerology and Petrology | 2 | √ | | √ | Geography Department |
| | 19A52C503 | Structural and Field Geology | 2 | √ | | √ | Geography Department |
| | 19A52C504 | Urban and Rural Geography | 2 | √ | | √ | Geography Department |
| | 19A52C505 | Political Geography | 2 | √ | | √ | Geography Department |
| | 19A52C507 | Agricultural Geography | 2 | √ | | √ | Geography Department |
| | 19A52C508 | Water Quality | 2 | √ | | √ | Geography Department |
| | 19A52C509 | SIG 1 | 2 | √ | | √ | Geography Department |
| | 19A52C510 | Cultural Geography | 2 | √ | | √ | Geography Department |
| | 19A52C511 | Potamology | 2 | √ | | √ | Geography Department |
| | | Elective Courses | 12 | √ | | √ | Geography Department |
| **Credite Total** | | | **32** | | | | |
| 6 | 19A52C601 | Regional Geography of the World | 2 | √ | | √ | Geography Department |
| | 19A52C602 | Social Geography | 2 | √ | | √ | Geography Department |
| | 19A52C603 | SIG 2 | 2 | √ | | √ | Geography Department |
| | 19A52C604 | Geohydrology | 2 | √ | | √ | Geography Department |
| | 19A52C605 | Indonesia | 2 | √ | | √ | Geography Department |
| | 19A52C606 | Land Resource Evaluation | 2 | √ | | √ | Geography Department |
| | 19A52C607 | Applied Remote Sensing | 2 | √ | | √ | Geography Department |
| | 19A52C608 | Disaster mitigation | 2 | √ | | √ | Geography Department |
| | 19A52C609 | AMDAL | 2 | √ | | √ | Geography Department |
| | | Elective Courses | 12 | √ | | √ | Geography Department |
| **Credite Total** | | | **30** | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 19A52C701 | KKL 2 | 2 | √ | | √ | Geography Department |
| | 19A52C702 | Seminar | 2 | √ | | √ | Geography Department |
| | 19A52C706 | Entrepreneurship | 3 | √ | | √ | Geography Department |
| | | Elective Courses | 10 | √ | | √ | Geography Department |
| **Credite Total** | | | **17** | | | | Geography Department |
| 8 | 19A52C801 | Community Service Program | 4 | √ | | √ | Geography Department |
| | 19A52C802 | Thesis | 6 | √ | | √ | Geography Department |
| **Credite Total** | | | **10** | | | | |
| **Total Credite of Courses** | | | **175** | | | | |