SELF ASSESSMENT REPORT

Bachelor of Chemistry

Bachelor of Chemistry Education

Master of Chemistry Education

Bachelor of Biology

Bachelor of Biology Education

Master of Biology Education

FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS NEGERI JAKARTA
INDONESIA

2021

PREFACE

All praise and thanks be to Allah S.W.T., The One Truly Almighty, for His abundance of grace so that Self-Assessment Report (SAR) document arrangement has been completed for international accreditation proposal for ASIIN of Cluster A - Mathematics and Natural Sciences Faculty (FMIPA - *Fakultas Matematika dan Ilmu Pengetahuan Alam*), Universitas Negeri Jakarta (UNJ). There are six study programs in Cluster A, namely Chemistry Study Program, Chemistry Education Study Program, Master of Chemistry Education Study Program, Biology Study Program, Biology Education Study Program, and Master of Biology Education Study Program.

The international accreditation proposal is one of the external quality assurances of FMIPA UNJ to accomplish the **Vision of UNJ, which is to become a reputable university in Asia.** International accreditation as external recognition of our quality assurance plays an important role to develop sustainable knowledge and technology, policies, and stakeholder needs.

We acknowledge Prof Dr. Komarudin, M.Si (Rector of UNJ); Prof. Dr. Suyono, M.Si (Vice-Rector of UNJ for Academic Affairs); Dr. Agus Dudung, M.Si. (Vice-Rector of UNJ for General and Staff Affairs); Dr. Abdul Syukur, M.Pd. (Vice-Rector of UNJ for Students Affairs); Dr. Totok Bintoro, M.Pd (Vice-Rector of UNJ for Planning and Partnership Affairs), and other leaders of UNJ for their supports, motivations, and guidance to all team of SAR ASIIN FMIPA collaborators, including The Coordinators of Study Program and their lecturers' team members; The Head and Team Members of Quality Assurance Board in UNJ and FMIPA, The Head and Team Members of UNJ Accreditation; Board of Faculty in FMIPA and Academic staff Team, and also for all parties who have contributed after this document.

Thank you to all students of FMIPA UNJ, Alumni, and all team members of SAR ASIIN FMIPA for their hard work, commitment, and partnership. Hopefully, our hard work benefits the students, FMIPA, UNJ, society, and nation.

Jakarta, 20 December 2021

Dean Faculty of Mathematics and Natural Sciences

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CHARACTERISTICS OF THE DEGREE PROGRAMMES - CLUSTER A

a) Name	Final degree (English translation)	b) Areas of Specializations	c) Corresponding level of EQF	d) Mode of Study	e) Double / Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor of Chemistry	S.Si (B.Sc.)	N/A	6	Full time	No	4 academic years (8 semesters)	144 SKS (216 ECTS)	Annually on August
Bachelor of Chemistry Education	S.Pd (B.Ed.)	N/A	6	Full time	No	4 academic years (8 semesters)	145 SKS (217,5 ECTS)	Annually on August
Master of Chemistry Education	M.Pd (M.Ed.)	N/A	7	Full time	No	2 academic years (4 semesters)	47 SKS (122,2 ECTS)	Annually on August
Bachelor of Biology	S.Si (B.Sc.)	N/A	6	Full time	No	4 academic years (8 semesters)	144 SKS (216 ECTS)	Annually on August
Bachelor of Biology Education	S.Pd (B.Ed.)	N/A	6	Full time	No	4 academic years (8 semesters)	144 SKS (216 ECTS)	Annually on August
Master of Biology Education	M.Pd (M.Ed.)	N/A	7	Full time	No	2 academic years (4 semesters)	44 SKS (114,4 ECTS)	Annually on August

INTRODUCTION

A. UNIVERSITAS NEGERI JAKARTA

Universitas Negeri Jakarta (UNJ) is in Jakarta, the capital city of Indonesia. It was founded on January 3rd, 1963, as the Faculty Education at the University of Indonesia (FKIP UI). The life chapter of Universitas Negeri Jakarta was begun when the Presidential Decree Number 1 in 1963 stipulated that the Faculty of Education of Universitas Indonesia, Institute of Teacher Education or *Institut Pendidikan Guru* (IPG), and other education apparatus and systems at that time should be integrated into one institution, Institute for Teacher Training and Education called Institut Keguruan dan Ilmu Pendidikan (IKIP) Jakarta. The decree became official on 16th May 1964 as the establishment of IKIP Jakarta (Appendix A.1). The history of UNJ is shown in figure 1.1.

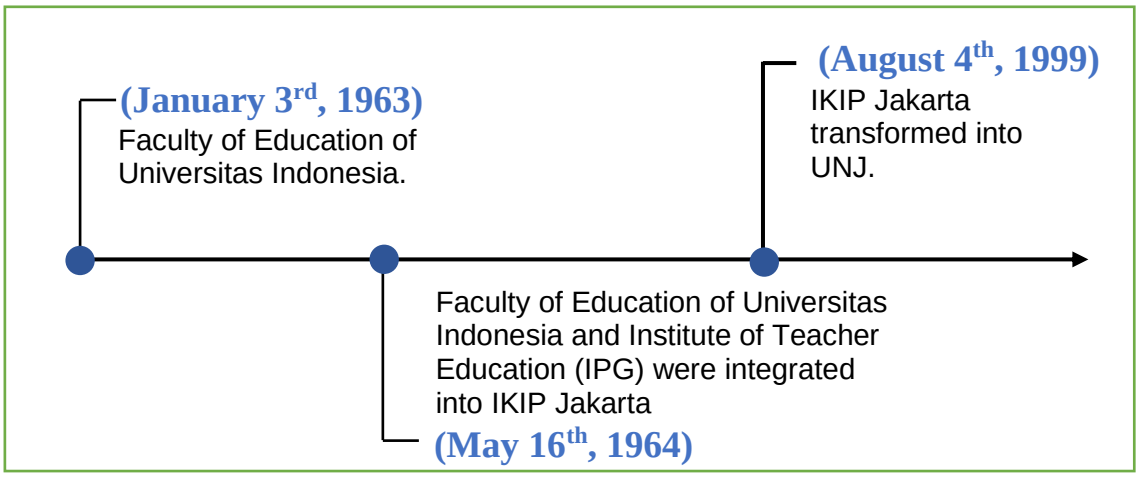

Figure 1. 1 The History of Universitas Negeri Jakarta

Due to the extension of a mandate given by the Ministry of Education and Culture in 1999, IKIP Jakarta (institute of teacher education) transformed into a university as UNJ (Appendix A.2). Developing sciences, technology, arts, languages, sports, and humanities with its central core business in education, UNJ has become one of the leading state universities in Indonesia by integrating education with other disciplines. In 2009, UNJ successfully gained its Public Service Agency (Badan Layanan Umum-BLU) (Appendix A.3).

As one of the pedagogical universities in Indonesia, UNJ has been experienced in teacher education programmes for 58 years. In 2021 UNJ had has 34,199 students, 981 lecturers and 779 staff. Along with “Educating and Dignifying the Nation” as its motto, UNJ is geared toward a multicultural education and entrepreneurial university. UNJ has eight faculties and one graduate school, namely:

1. Faculty of Education
2. Faculty of Languages and Arts
3. Faculty of Mathematics and Natural Sciences
4. Faculty of Social Sciences
5. Faculty of Engineering
6. Faculty of Sport Sciences
7. Faculty of Economics

8. Faculty of Psychological Education
9. Postgraduate Programmes

UNJ was the Chair of Asosiasi Lembaga Pendidikan Tenaga Kependidikan Negeri Indonesia (ALPTKNI) or The Association for Indonesian 12 State Pedagogical Universities in Indonesia, namely:

1. Universitas Negeri Jakarta, DKI Jakarta Province
2. Universitas Negeri Malang, Malang, East Java Province
3. Universitas Pendidikan Indonesia, Bandung, West Java Province
4. Universitas Negeri Makassar, Makassar, South Sulawesi Province
5. Universitas Negeri Surabaya, Surabaya, East Java Province
6. Universitas Negeri Semarang, Semarang, Central Java Province
7. Universitas Negeri Yogyakarta, DI Yogyakarta Province
8. Universitas Negeri Padang, Padang, West Sumatera Province
9. Universitas Negeri Medan, Medan, North Sumatera Province
10. Universitas Negeri Gorontalo, Gorontalo, Gorontalo Province
11. Universitas Negeri Manado, Manado, North Sulawesi Province
12. Universitas Pendidikan Ganesha, Singaraja, Bali Province

Those 12 state pedagogical universities are spread throughout the country's main islands of Java (6 universities), Sumatera (2 universities), Sulawesi (3 universities), and Bali (1 university). Up to the present, these universities have been entrusted and mandated as institutions that execute professional teachers' certifications programmes in Indonesia.

UNJ has collaborated with many countries in ASIA, Africa, Australia, Europe, the Middle East, and America. Particularly with Curtin University, UNJ had a fruitful collaboration in conducting the 8th International Conference on Science, Mathematics, and Technology Education, on 21-24 November 2015 in Jakarta. Under the Australia-Indonesia Institute Grant STEM (Science, Technology, Engineering, and Mathematics)

Since as a former IKIP Jakarta, established in 1964, UNJ has proven to provide Indonesia with outstanding teachers as our best effort in developing education praxis, research, and community services across disciplines.

A.1 The Vision of Universitas Negeri Jakarta

*"*To Become A Reputable University In Asia."

T*o become a reputable university in Asia* is the Vision of UNJ based on the Decree of Minister of Research, Technology and Higher Education No. 44 the Year 2018, article 24 about UNJ Statute. The document that contains fundamental guidance of organizing UNJ applied as the foundation of regulations and operational procedures arrangement in UNJ.

UNJ is a state pedagogical university that carries Lembaga Pendidikan Tenaga Kependidikan (LPTK), a teacher education institute's missions by expanding mandate to develop knowledge in educational and non-educational programmes through the university. An organization with a mission to establish a qualified learning ability for non-education study programmesThis programme enables the scientists of education to interact intensively with non-education scientists so that the cultural evolution of knowledge occurs and gives contributions to the improvement of education quality in Indonesia

Therefore, UNJ has a policy that advances in science, technology, and the developed arts will be utilized as much as possible to improve the quality of education in particular and science and technology in general.

This mandate expansion has affected several organizing UNJ, including achieving the vision. The external or internal transformation dynamics have required UNJ to keep reformation. The reformation of society demands which are quick and dynamic, have to be adapted by UNJ in terms of having a maturity of policy that is undergone through extensive experiences during the higher education organization development. The UNJ vision has changed from **"becoming an excellent and competitive university to build a more advanced, democratic, and wealthy Indonesian society based on Pancasila"** to **"to become a reputable university in Asia."**

A.2 The Mission of Universitas Negeri Jakarta

> ***"Organizing the Tridharma of Higher Education that is Excellent and Useful for the Benefit of Humans"***

The mission of UNJ is stated in the Decree of Minister of Research, Technology and Higher Education No. 44 the Year 2018, article 25 about UNJ Statute. The mission is a step and guidance to organize the university to become a reputable university in the ASIA region. Some fundamental values applied in organizing UNJ are: (1). Truth and Wisdom; (2) Academic Integrity; (3) Democratic and Humanist; (4) Diversity and Equality; (5) Beneficial for Humanity; (6) Sustainability. Implementation of the UNJ mission aims to achieve university goals, such as creating an innovative, advanced, and civilized society through science and technology development, application, and expansion.

To achieve the vision, mission, and aims, UNJ has arranged: (a) a long-term development plan that consists of plans and development programme for 25 years; (b) strategic plan that consists of plans and development programme for five years; and (c) operational plan that consists of strategic plan explanation for one year of lists of programme and activity.

B. FACULTY OF MATHEMATICS AND NATURAL SCIENCES

Vision and Mission of Faculty of Mathematics and Natural Sciences (FMIPA - Fakultas Matematika dan Ilmu Pengetahuan Alam) or delivered from the Vision, Mission, Aim, and Goal of UNJ. Vision and Mission Faculty are formulated by involving internal and external stakeholders. Internal stakeholders conduct the review of monitoring and self-evaluation towards *Tridharma* (education, research, and community service) in Faculty. External stakeholders provide feedback through the tracer study questionnaire. The questionnaire consists of roles, participations, and graduate working performance to meet society's demands. The vision and mission of FMIPA are elaborated into aims and targets/goals, and their achievement strategies which are manifested gradually through FMIPA Strategic Plans synchronized with UNJ Strategic Plan.

B.1 The Vision of FMIPA

> **"To become an excellent and competitive faculty in the field of Mathematics, Mathematics Education, Natural Sciences and Natural Sciences education in Asia."**

The Decree of Minister of Research, Technology, and Higher Education No.44 the Year 2016 article 56 about Organization and Management of UNJ stated that a faculty is an academic organizer under the university and responsible to its rector. The faculty has a task to hold and organize academic, vocation and professional education in one or more science

and technology groups. The faculty does its functions as (a) an organizer and developer of education in faculty neighbourhood; (b) a researcher for science and technology development; (c) an organizer of community service; (d) a manager of training for educators, academic staff, and students; and (e) a manager of administration.

FMIPA has been part of UNJ within the organizational structure and administrative affairs and played its role in the educational organization and development in Mathematics and Natural Sciences for holding the bachelor's programme for Teacher and Non-Teacher Education and the Master's programme for Teacher Education. The vision of FMIPA is derived from the university's image. In 2020 FMIPA will have synchronized its vision that supports the university vision to become a reputable university in Asia.

FMIPA has collaborated in education, research, and community service with various universities from ASIA, Europe, Africa, Australia, and America. Several university partners in Africa: University of Ibadan-Nigeria, Fayoum University-Egypt. Partners in the ASIA region are UTM-Malaysia, NIE-Singapore, KMUTT-Thailand, Chulalongkorn University, Catmandu University-Banglades Partners in Europe are Bremen University-Germany, Muenster University, Groningen University-Germany, Giesen University-Germany. Partners in the Middle East region are Saudi Arabia Egypt. Partners in the America Region are Villanova University the University of Central Oklahoma. The cooperation carried out provides many benefits for both parties in increasing the quality of higher education.

B.2. The Mission of FMIPA

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

C. STUDY PROGRAMME

The Vision of the Study Programme and the Vision of the University and the Faculty is formulated through internal studies based on the results of monitoring and self-evaluation of the performance of Tridharma (Education, Research, and Community Service). The Study Programme level and referring to external results in tracer studies for alumni and graduate users provide an overview of graduates' role participation and performance in meeting community needs. The Vision of Study Programme is further elaborated along with the goals, objectives, and achievement strategy, which gradually realized referring to the Strategic Plan of the Faculty and the University. Based on the information from the evaluation results of the internal and external environment, then the identification of strengths, weaknesses, opportunities, and threats is carried out, then analyzed with internal and external factor evaluation matrices to formulate the vision of the study programme.

C.1. The Vision of Bachelor's Degree in Chemistry Study Programme

The vision of Bachelor's Degree in Chemistry Study Programme is to become one of the undergraduate chemistry study programmes that produce professional chemistry graduates who can compete in Asia, are responsive to the development of science and technology, and have social and environmental awareness.

C.2 The Vision of Bachelor's Degree in Chemistry Education Study Programme

The vision of Bachelor's Degree in Chemistry Education Study Programme is to become the chemistry education programme that provides chemistry education graduates who are professional, innovative, adaptive, and competitive at the national, regional, and global levels

C.3 The Vision of Master's Degree of Chemistry Education Study Programme

The vision of Master's Degree of Chemistry Education Study Programme is to become a centre for innovative learning and development of ICT-based chemistry education research in Asia.

C.4 The Vision of Bachelor's Degree in Biology Study Programme

The vision of Bachelor's Degree in Biology Study Programme is to become a centre for learning and research Biology in Asia that focuses on biodiversity and conservation.

C.5 The Vision of Bachelor's Degree in Biology Education Study Programme

The vision of Bachelor's Degree in Biology Education Study Programme is to become a leading digital technology-based Biology learning reference centre in Asia.

C.6 The Vision of Master's Degree of Biology Education Study Programme

The vision of Master's Degree of Biology Education Study Programme is to become an excellent study programme in education and digital and technology-based biology education in Asia.

CRITERIA 1:THE DEGREE PROGRAMME: CONCEPT, CONTENT & IMPLEMENTATION

1.1 Objective and Learning Outcomes of a Degree Programme (Intended Qualification Profile)

1.1.1. The Qualification Profile (QP)

The FMIPA is part of Universitas Negeri Jakarta, which has the responsibility to have graduated with qualifications in the fields of Mathematics and Natural Sciences and professional Mathematics education, able to utilize information and communication technology, have entrepreneurial skills, have character, and are religious, according to stakeholder needs, and able to compete in Asia.

The Profile of graduates of bachelor and master study programme is determined based on:

1. The Indonesian President's Regulation (PPRI) No. 8/2012 concerning KKNI (Indonesian National Curriculum Framework), Permenristekdikti (Regulation of Minister of Research, Technology, and Higher Education) No. 44 of 2015 concerning National Standards for Higher Education.
2. Professional Association Society's Minimum Learning Mastery level for bachelor and master's study programmes
3. ASIIN standard for bachelor and master's degree programmes.

1.1.1.1 The QP of Bachelor's Degree in Chemistry Study Programme

The QP of a bachelor's degree in the Chemistry Study Programme and its specifications is presented in Table 1.1

Table 1. 1 The QP of bachelor's degree in Chemistry Study Programme

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

1.1.1.2 The QP of Bachelor's Degree in Chemistry Education Study Programme

The QP of a bachelor's degree in the Chemistry Education Study Programme and its specifications is presented in Table 1.2.

Table 1. 2 The QP of Bachelor's Degree in Chemistry Education Study Programme

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

1.1.1.3 The QP of Master's Degree in Chemistry Education Study Programme

The QP of a master's degree in Chemistry Education Study Programme and its specifications is presented in Table 1.3.

Table 1. 3 The QP of Master's Degree in Chemistry Education Study Programme

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

1.1.1.4 The QP of Bachelor's Degree in Biology Study Programme

The QP of a bachelor's degree in the Biology Study Programme and its specifications is presented in Table 1.4.

Table 1. 4 The QP of Bachelor's Degree in Biology Study Programme

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

1.1.1.5 The QP of Bachelor's Degree in Biology Education Study Programme

The QP of a bachelor's degree in the Biology Education Study Programme and its specifications is presented in Table 1.5.

Table 1. 5 The QP of Bachelor's Degree in Biology Education Study Programme

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

1.1.1.6 The QP of Master's Degree in Biology Education Study Programme

The QP of a master's degree in Biology Education Study Programme and its specifications is presented in Table 1.6.

Table 1. 6 The QP of a Master's Degree in Biology Education Study Programme

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

1.1.2 The Programme Education Objective (PEO)

The Faculty of Mathematics and Natural Sciences is the implementation aspect of Education, Learning, Research Community Service, and Partnership of UNJ in mathematics and sciences study. It has two levels of education, are master's Programme and Bachelor's Programme in Mathematics, Mathematics Education, Natural Science, and Natural Science Education with fourteen study programmes in general. The master's programmes include Mathematics Education, Physics Education, Chemistry Education, and Biology Education. Meanwhile, the Bachelor of Education programme consists of Mathematics Education, Physics Education, Chemistry Education, and Biology Education. Finally, the Bachelor of the non-education programme includes Mathematics, Physics, Chemistry, Biology, Computer Science, and Statistics. Since 2020, the implementation of the bachelor's programme in this faculty has accommodated the policy of Freedom of Learning (MBKM-Merdeka Belajar Kampus Merdeka), which is applied within the education and learning programme non-academic programme but still relevant.

The faculty's aims are as the following points:
1. To create a graduate in mathematics, mathematics education, natural sciences, and natural

sciences education which is professional, able to apply information technology and communication, faithful in God, has entrepreneurship skills, meet the stakeholder requirements, and competes in Asia.
2. To develop scientific papers based on the research in mathematics, mathematics education, natural sciences, and natural sciences education.
3. To conduct community services in mathematics, mathematics education, natural sciences, and natural sciences education to benefit society.
4. To have a mutual partnership with other national and international, mainly related with the development of Faculty of Mathematics and Natural Sciences UNJ.

General procedures of graduate profile formation, learning outcome, and curriculum of study programme have been following the standard (from guidelines of curriculum development, such as Higher Education and Profession Association, National Standard for Higher Education, Accreditation Bureau, and Association Profession of Study Programme) as presented in Figure 1.1 and verified by academic board of faculty. The procedure involves internal and external stakeholders, including academic staff, university and faculty members, alumni, students, experts, and external stakeholders. The design of the mechanism scheme of programme learning outcome is shown in Figure 1.2.

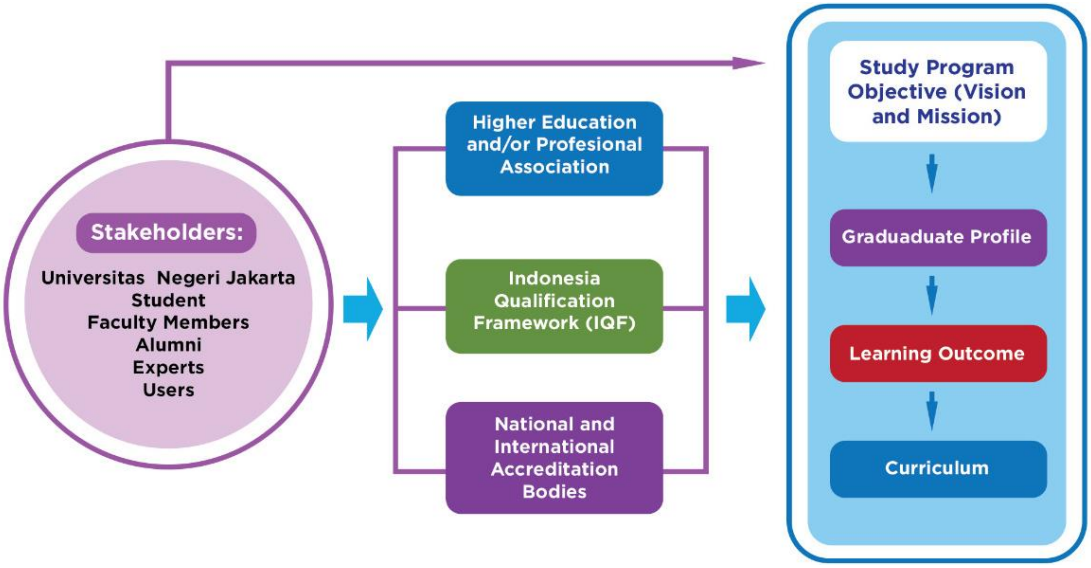

Figure 1. 2 Design of Mechanism Scheme of Programme Learning Outcomes

The information of curriculum is provided in Academic Guidance Book (BPA) (Appendix 1.5) which is published to guide the academic implementation in Bachelor and Master's study programmes. It has been relevant with the Minister of Education and Culture policy about Independent Freedom of Learning (MBKM).

1.1.2.1 The PEO of Chemistry Study Programme

The PEO of the Chemistry Study Programme are to nurture graduates who are qualified as scientists, academics, industry experts, and entrepreneurs at the beginning of their careers. The programme provides the opportunity for graduates to be able to:
1. have substantial knowledge, skill, and competency for problem-solving in chemistry to advance in diverse career paths or pursue a higher degree in chemistry

2. be professionals with appropriate soft skills and excellent work ethics
3. demonstrate a professional attitude, integrity, and increased responsibility to the community and global society.

1.1.2.2 The PEO of Bachelor of Chemistry Education Study Programme

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

1. have educational qualifications, creative, adaptive, competitive, and lifelong learning character.
2. be professionals with attitudes, work ethics, responsibility, leadership, communication skills, and can work individually and collaborate in groups
3. argue scientifically to solve career, community, nation, and global problems.

1.1.2.3 The PEO of Master of Chemistry Education Study Programme

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

1. have in-depth knowledge of Technological Pedagogical Content Knowledge (TPACK) and apply the concept of green chemistry to the chemistry learning process.
2. Teach at high school and university level with good attitudes, work ethics, responsibility, leadership, communication skills, and professionalism.
3. Have a competitive advantage in global competition and have social competence.
4. Have a critical understanding of solving educational problems and communicate and collaborate in groups.

1.1.2.4 The PEO of Bachelor of Biology Study Programme

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

1. Be able to acknowledge basic mathematics and natural sciences, fundamental biology, molecular and cell organisms, and other related fields.
2. Be able to utilize their knowledge and skills based on research methodology to solve a problem on biology and other related issues.
3. Be able to communicate in teamwork to collaborate and create networking.
4. Be able to have good ethics in the academic, social, and environmental context.
5. Be able to develop knowledge for further study and work needs as a long-life learner.

1.1.2.5 The PEO of Bachelor of Biology Education Study Programme

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

1. plan, develop, implement, and evaluate biology learning professionally and globally competitively by utilizing digital technology.
2. Manage biology education laboratories by minding safety, occupational health, and environmental aspects according to national and international standards.
3. Design, implement and evaluate entrepreneurial activities in biology and biology education.
4. Master professional ethics and responsibility
5. have the ability to further self-development (life-long learning).

1.1.2.6 The PEO of Master of Biology Education Study Programme

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

1. Be able to design, implement, succeed, and assess biology learning based on local wisdom and digital technology.
2. Be able to design and carry out research in biology and biology education and communicate it in various scientific forums.
3. Be able to design curriculum and management of education units and implement them in lifelong learning.

1.1.3 The Programme Learning Outcomes (PLO)

1.1.3.1 The PLO of Bachelor of Chemistry Study Programme

Learning Outcomes of bachelor's degree of Chemistry Study Programme are presented in Table 1.7. The PLO are classified into two areas, namely social competence and specialist competence.

Table 1. 7 The PLO of Bachelor of Chemistry Study Programme

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

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

The relation of PLO and PEO of the Bachelor of Chemistry Study programme is described in the matrix below. The matrix of PLO and PEO of the Bachelor of Chemistry Study Programme is shown in Figure 1.3.

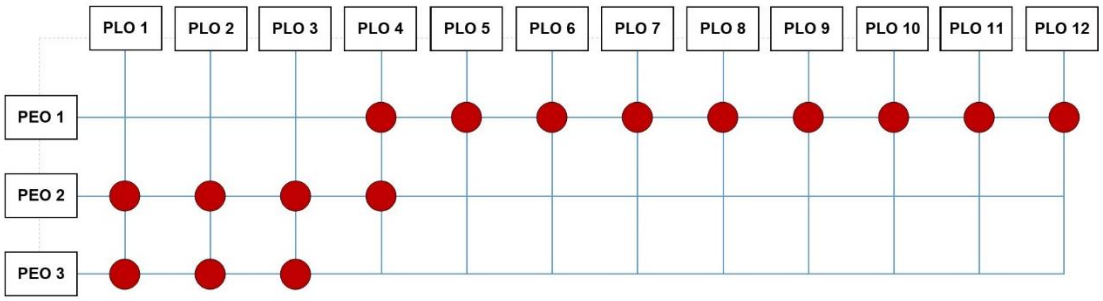

Figure 1. 3 Matrix of PLO and PEO of Bachelor of Chemistry Study Programme

Subject-specific criteria are developed based on the classification of the chemistry study programme body of knowledge and its PLO during the course determination. The description of Subject-Specific Criteria (SSC) for the Chemistry Study Programme and Chemistry Education Study Programme is presented in Table 1.8. and Table 1.9

Table 1. 8 The SSC of Chemistry Study Programme and Chemistry Education Study Programme

SSC (Subject-Specific Criteria)		
Specialist competences	**SSC 1**	Have gained chemistry-relevant fundamental knowledge of mathematics and the natural sciences.
	SSC 2	Be able to have sound knowledge of the core subjects of chemistry, including inorganic, organic and physical chemistry, and analytical chemistry.

SSC (Subject-Specific Criteria)		
	SSC 3	Be able to analyze the subject's characteristics (content knowledge) and students' characteristics and select appropriate methods, models, approaches, strategies, and media and apply actively, innovatively, creatively in each academic unit.
	SSC 4	Be able to carry out practical chemistry work and have learnt how to handle chemicals independently and safely in the lab.
	SSC 5	Be able to know safety and environmental issues and the legal fundamentals.
	SSC 6	Have gained methodological competence in chemistry education and can apply this in other contexts.
	SSC 7	Be able to obtain, interpret, and evaluate scientific and technical data and draw sound conclusions that consider scientific, technological and ethical findings.
	SSC 8	Be able to independently solve problems of a scientific/application-oriented nature and present the results.
	SSC 9	Be able to pursue life-long learning.
	SSC 10	Be able to communicate with colleagues in the working field and the broader public about chemistry education-related contents and problems.
Social competences	**SSC 11**	Be aware of social and ethical responsibility in their actions and develop appropriate leadership responsibility.
	SSC 12	Be able to work both alone and as a member of international, mixed-gender groups
	SSC 13	Be prepared for being in professional life and an academic environment through adequate practical relevance of the degree programme.

The relevance between PLO and SSC is described in Figure 1.4

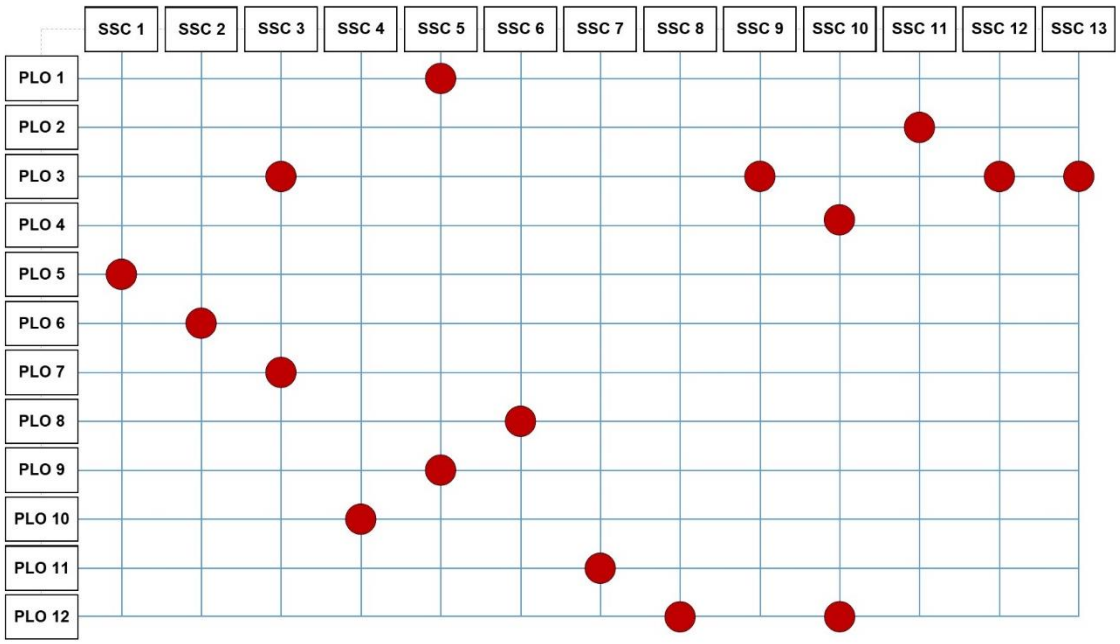

Figure 1. 4 Mapping of PLO and SSC of Bachelor of Chemistry Study Programme

1.1.3.2 The PLO of Chemistry Education Study Programme

Learning Outcomes of bachelor's degree of Chemistry Education Study Programme are presented in Table 1.9. The PLOs are classified into two areas, namely social competence and specialist competence.

Table 1. 9 The PLO of Bachelor of Chemistry Education Study Programme

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

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

The relevance between PLO and PEO of the Chemistry Education Study Programme is described in Figure 1.5.

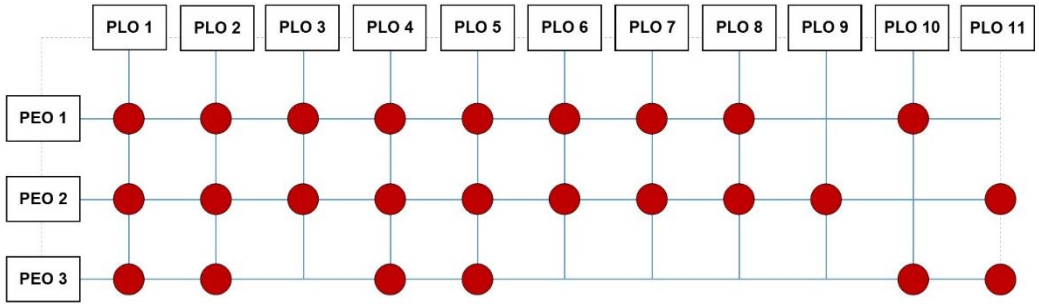

Figure 1. 5 Matrix of PLO and PEO of Bachelor of Chemistry Education Study Programme

The relevance between PLO and SSC of the Chemistry Education Study Programme is described in Figure 1.6.

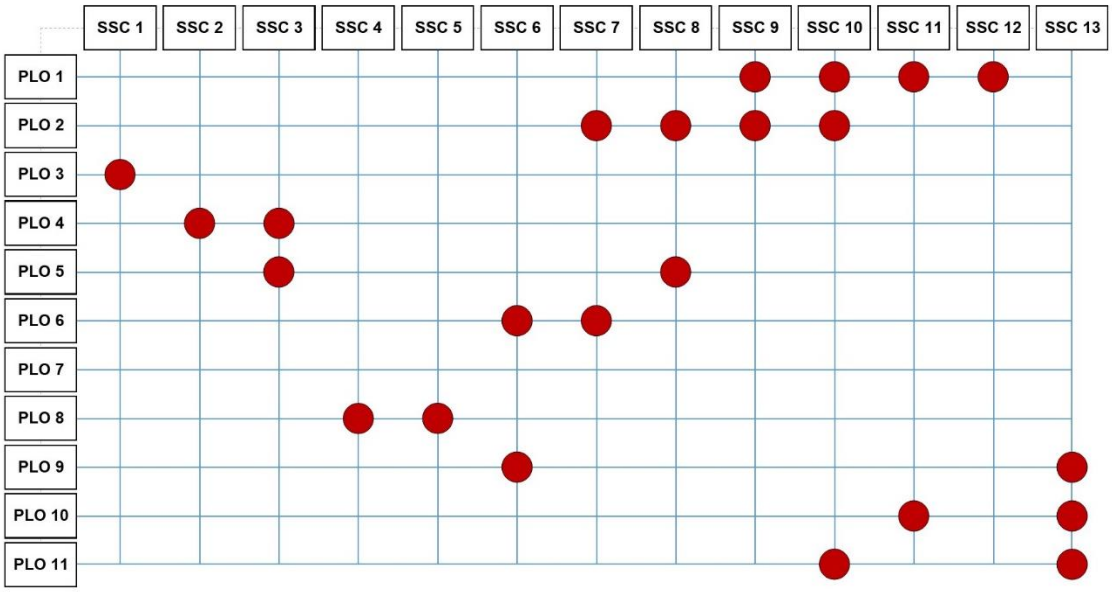

Figure 1. 6 Mapping of PLO and SSC of Bachelor of Chemistry Education Study Programme

1.1.3.3 The PLO of Master of Chemistry Education Study Programme

Learning Outcomes of master's degree of Chemistry Education Study Programme are presented in Table 1.10. The PLOs are classified into two areas of social competence and specialist competence.

Table 1. 10 The PLO of Master of Chemistry Education Study Programme

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

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

The relevance between PLO and PEO of the Master of Chemistry Education Study Programme is described in Figure 1.7.

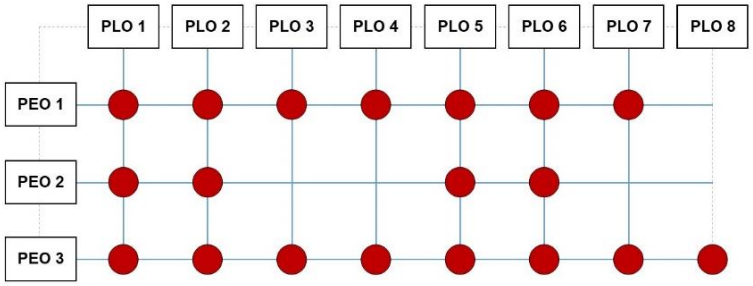

Figure 1. 7 Matrix of PLO and PEO of Master of Chemistry Education Programme

Subject-specific criteria are developed based on the chemistry study programme body of knowledge and its PLO classification. The Subject-Specific Criteria (SSC) for the master Chemistry Education Study Programme graduates are stated in Table 1.11.

Table 1. 11 The SSC of Master of Chemistry Education Study Programme

SSC (Subject-Specific Criteria)		
Specialist competences	SSC 1	Have escalated their knowledge in core subjects, particular subjects, or interdisciplinary subjects.
	SSC 2	Be able to know building up on a bachelor's degree level in chemistry, which forms a foundation for original and competent development and implementation of ideas within a research area.
	SSC 3	Be able to have qualified and professional competencies, e.g., work as a chemist in industry or public service.
	SSC 4	Be able to carry out independent scientific work.
	SSC 5	Be able to apply the knowledge and understanding to solve problems in new and unaccustomed situations involving broader (or multidisciplinary) issues.
Social competences	SSC 6	Have acquired a capacity to carry out independent scientific work and organize, conduct, and lead more complex projects.
	SSC 7	Have acquired scientific, technical, and social competencies (abstraction ability, systems analytical thinking, capacity for teamwork, ability to communicate, international and intercultural experience, etc.), and are therefore prepared to take on leadership responsibility.
	SSC 8	Be able to combine and independently apply specialized knowledge in various component disciplines to organize, work on and manage complex problems.
	SSC 9	Be able to make decisions based on incomplete or limited information.
	SSC 10	Be able to take into account ethical responsibility in their decisions.

The relevance between PLO and SSC of the Master of Chemistry Education Study Programme is described in the matrix Figure 1.8.

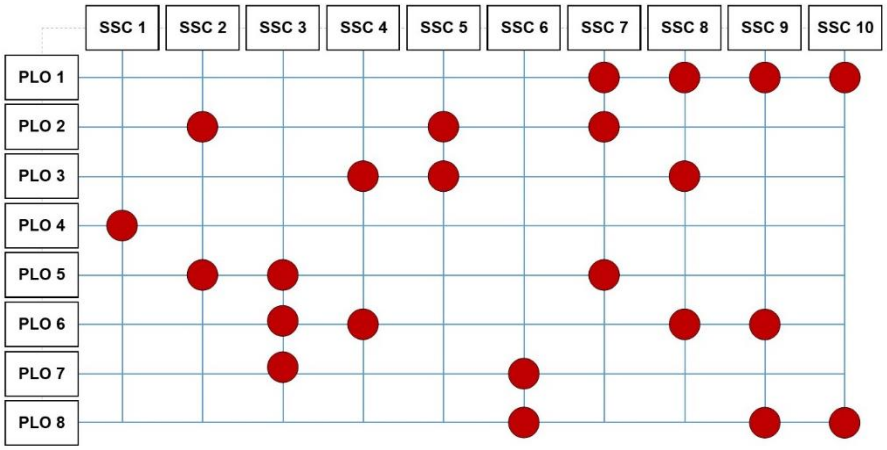

Figure 1. 8 Mapping PLO and SSC Master of Chemistry Education Study Programme

1.1.3.4 The PLO of Biology Study Programme

Competence profiles of Biology programmes are set to answer the future challenges on the need of the careers mentioned. Based on this reason, Programme Learning Outcome (PLO) is designed in curriculum development, presented in Table 1.12. The PLOs are classified into two areas of social competence and specialist competence.

Table 1. 12 The PLO of Biology Study Programme

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

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

The connection can be seen in Figure 1.9 to see the relevance between PLO and PEO sets.

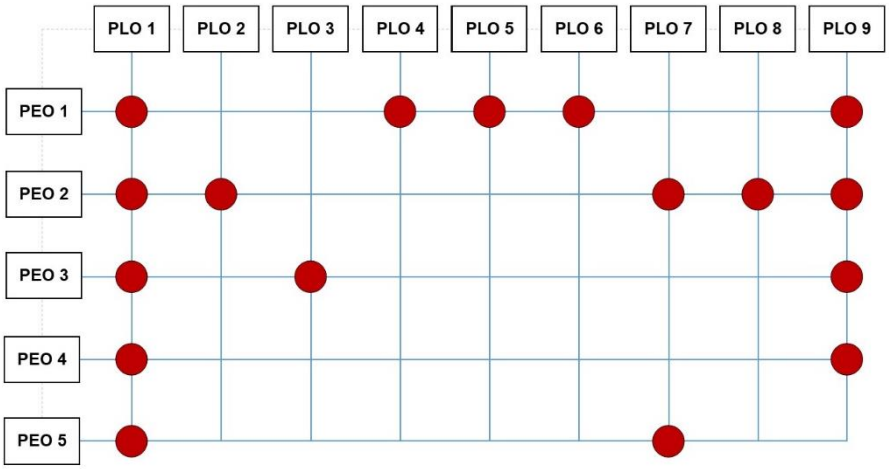

Figure 1. 9 Matrix of PLO and PEO of Biology Study Programme

The Subject-Specific Criteria (SSC) are given from ASIN SSC 10 about Life Sciences, which can be accessed online at https://www.asiin.de/. The SSC is presented in Table 1.13.

Table 1. 13 The SSC of Biology Study Programme and Biology Education Study Programme

SSC (Subject-Specific Criteria)		
Specialist competences	**SSC 1**	Have acquired sound fundamental biology-relevant knowledge of mathematics and the natural sciences
	SSC 2	Have a comprehensive knowledge of the fundamentals of molecular, cell, and organismic biology
	SSC 3	Have gained methodological competence in Life Sciences and are also able to apply this in other contexts
	SSC 4	Are capable of independent practical work in laboratories and the field as well as handling organisms
	SSC 5	Have relevant knowledge of safety and environmental issues as well as the associated legal fundamentals

SSC (Subject-Specific Criteria)		
	SSC 6	Have acquired sound knowledge in at least one particular area of Life Sciences
	SSC 7	Are capable of recognizing and solving subject-specific problems
	SSC 8	Are capable of solving Life Sciences problems and presenting the results
Social Competences	**SSC 9**	Have trained conceptual, analytical, and logical thinking
	SSC10	Have an awareness of possible social, ethical and environment-related effects of their actions
	SSC11	Have acquired communication skills –also in a foreign language– and can communicate scientific information to experts and laypersons in a suitable manner
	SSC12	Have a capacity for teamwork, also on an intercultural basis
	SSC13	Have acquired lifelong learning strategies

The relevance between PLO and SSC of the Biology Study Programme is described in the matrix Figure 1.10.

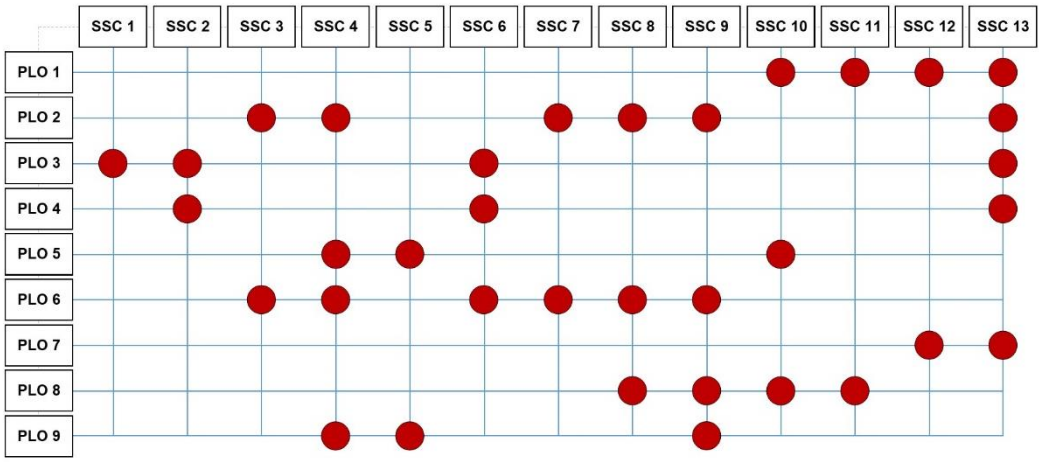

Figure 1. 10 Matrix of PLO and SSC of Biology Study Programme

1.1.3.5 The PLO of Biology Education Study Programme

Learning Outcomes of bachelor's degree of Biology Education Study Programme classified into two areas is presented in Table 1.14.

Table 1. 14 The PLO of Bachelor's Degree of Biology Education Study Programme

Area	Code	Programme Learning Outcomes
Specialist competences	PLO 1	Be able to understand the basic concepts of science (basic mathematics, physics, chemistry, and general biology).
	PLO 2	Be able to understand the concept of biology cell and molecular, development structure, biosystematics and evolution, physiology,

Area	Code	Programme Learning Outcomes
		genetic and biotechnology, ecology, environment, and conservation.
	PLO 3	Be able to implement strategic management, biology laboratory management, and field study in a unit of education.
	PLO 4	Be able to understand the research procedures and research publication in biology education and the biology field of study.
	PLO 5	Be able to solve problems and make decisions on biology cell and molecular study, development structure, biosystematics and evolution, physiology, genetic and biotechnology, ecology, environment, and conservation by implementing relevant knowledge, method, and technology in multidisciplinary areas of study.
	PLO 6	Be able to manage a biology learning laboratory based on a classroom, field, and virtual laboratory.
	PLO 7	Be able to conduct research and publish a research publication in biology education and the biology field of study.
Social competences	PLO 8	Be able to Show religious attitude, good ethics, social awareness, responsibility, and leadership.
	PLO 9	Be able to integrate values, norms, and academic ethics.
	PLO 10	Show some thinking abilities which are conceptual, analytic, logical, critical, creative, and innovative to solve problems.
	PLO 11	Have some abilities in social sensibility, ethics, and caring attitude to the society.
	PLO 12	Have some abilities in communication, literation, leadership, and self-development strategy.
	PLO 13	Be able to understand and implement the philosophy of education in the *Technological Pedagogical Content Knowledge* (TPACK) learning base.
	PLO 14	Be able to understand working ethics in the biology education field of study.
	PLO 15	Be able to analyze and generate ideas for entrepreneurship programmes in biology education and the biology field of study.
	PLO 16	Be able to implement biology teacher competencies with *Technological Pedagogical Content Knowledge* (TPACK) learning base.
	PLO 17	Be able to understand working ethics in the biology education field of study.

Area	Code	Programme Learning Outcomes
	PLO 18	Be able to design and implement a programme of entrepreneurship based on biology education and biology field of study.

The relevance between PLO and PEO of the Biology Education Study Programme is described in the matrix Figure 1.11.

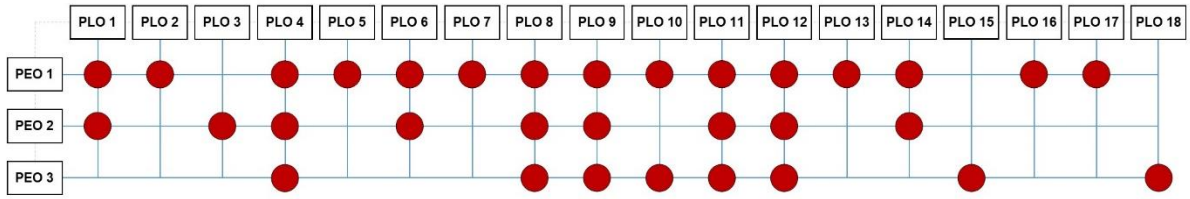

Figure 1. 11 Matrix of Relationship between Programme Learning Outcomes (PLO) and Programme Educational Objective (PEO) of Biology Education Study Programme

The relevance of PLO and SSC of the Biology Education Study Programme is presented in the matrix Figure 1.12.

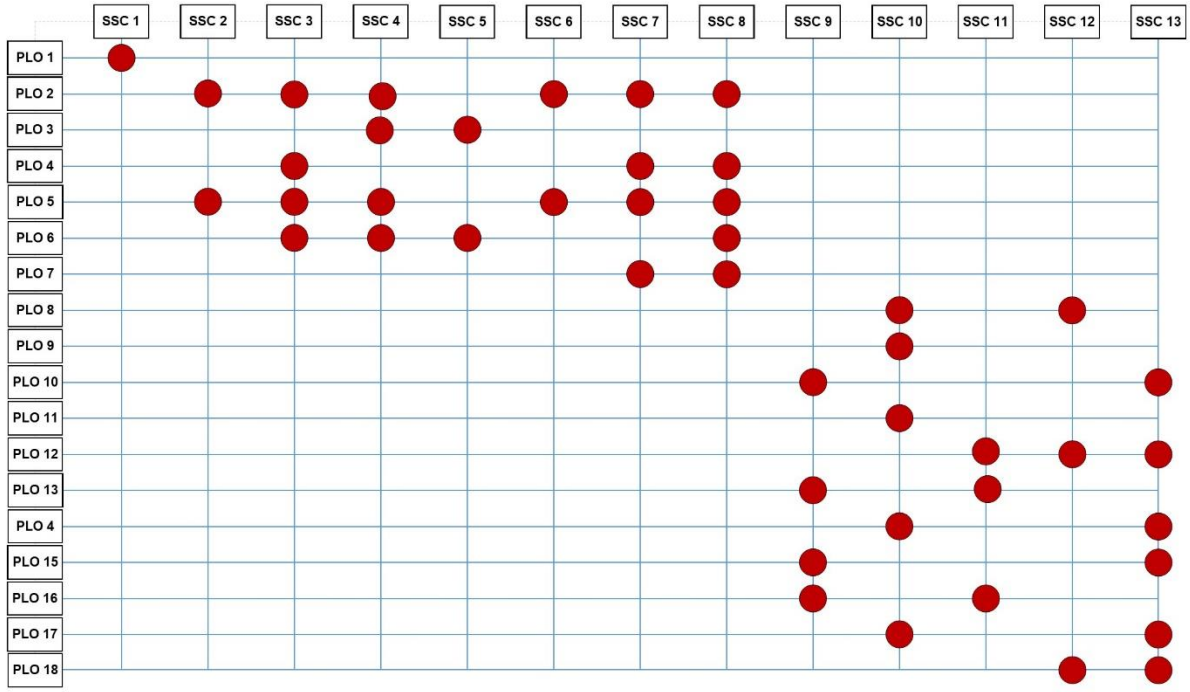

Figure 1. 12 Matrix of Relationship between Programme Learning Outcomes (PLO) and Subject-Specific Criteria (SSC) of Biology Education Study Programme

1.1.3.6 The PLO of Master of Biology Education Study Programme

Learning Outcomes of the Master of Biology Education Study Programme are presented in Table 1.15. The PLO are classified into two areas of social competence and specialist competence.

Table 1. 15 The PLO of Master of Biology Education Study Programme

Area	Code	Programme Learning Outcome
Social Competences	PLO1	Have integrity, working ethics, Self-development, and do some learning innovations to improve quality of life-based on life-long learning (PLO1)
	PLO2	Be able to implement analytical thinking, critical thinking, innovative thinking, and abstraction in the biology education area of study (PLO2).
	PLO3	Be able to cooperate in multicultural group work and collaborate with stakeholders to solve a problem in education (PLO3).
Specialist Competences	PLO4	Be able to develop the knowledge of educational philosophy and theory in biology education and biology instruction (PLO4).
	PLO5	Be able to design and organize a biology learning process with classical-based approach, laboratory-based approach, natural-based approach, and digital/virtual-based approach in a unit of education.
	PLO6	Be able to design and publish research through any approach/method to solve an issue in the biology education area of study (PLO5).
	PLO7	Be able to organize and develop learning based on digital technology relevant to characteristics and students' potentials. (PLO6).
	PLO8	Be able to design and conduct an evaluation and assessment of learning in a unit of education (PLO7).
	PLO9	Be able to improve the mastering of biology learning materials in plant and animal structures, environment, bio conservation, biomolecular, and biotechnology (PLO 8).
	PLO10	Be able to analyze and synthesize a solution for a problem in the biology learning process through interdisciplinary, transdisciplinary, and multidisciplinary approaches.

The relevance between PLO and PEO of the Master of Biology Education Study Programme is described in the matrix Figure 1.13

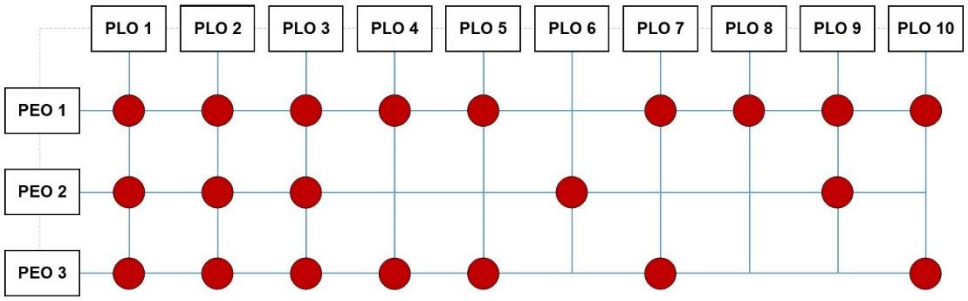

Figure 1. 13 Matrix of PLO and PEO of Master of Biology Education Study Programme

The Subject-Specific Criteria (SSC) are given from ASIN SSC 10 about Life Sciences for Master's Degree, which can be accessed online at https://www.asiin.de/. The description of SSC is presented in Table 1.16.

Table 1. 16 SSC of Master of Biology Education Study Programme

SSC (Subject-Specific Criteria)		
Specialist competences	SSC 1	Have advanced their knowledge in core subjects, subject-relevant or interdisciplinary subjects.
	SSC 2	Be in a position to discuss complex life science issues and own research results comprehensively and in the context of current international research and present these in writing (e.g., Master's thesis, scientific publication) and orally (e.g., lecture with free discussion).
	SSC 3	Have gained subject-specific and interdisciplinary problem-solving competence.
Social Competences	SSC 4	Have gained the ability to combine specialized knowledge of various component disciplines, carry out independent scientific work, organize, conduct, and lead more complex projects, and publish the results.
	SSC 5	Have acquired social competencies, such as abstraction ability, systems analytical thinking, capacity for teamwork, ability to communicate, international and intercultural experience, and others, and are therefore especially prepared to take on leadership responsibilities.
	SSC 6	Be in a position to assess the social and environment-related effects of their actions.

The relevance of PLO and SSC of the Master of Biology Education Study Programme is presented in the matrix Figure 1.14.

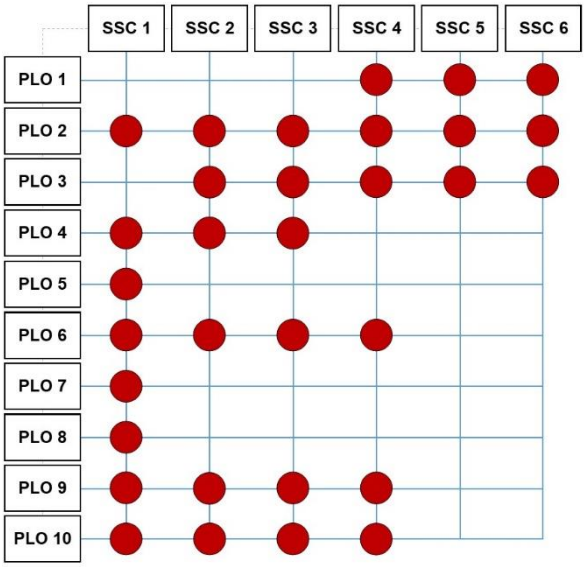

Figure 1. 14 Matrix of PLO and SSC of Master of Biology Education Study Programme

1.2 The Title of Degree Programme

The name of the degree programme is based on the Decree of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 57/M/KPT/2019 concerning Names of Study Programmes in Higher Education in Indonesian and in English.

The title to be attached to the bachelor's degree in Chemistry and Biology is Bachelor of Science (B.Sc.). The bachelor's degree of Chemistry Education and Biology Education is a Bachelor's Education (B.Ed.). The Master of Chemistry Educational degree and Master's Biology Educational degree is Master of Education (M.Ed.). Furthermore, the ministry of education decree specifies the details of the degree programme (Appendix 1.1).

1.3 Curriculum

The process of arrangement, implementation and development of curriculum at the Faculty of Mathematics and Natural Sciences UNJ has nationally referred to the government and university policies. Besides, it is also supported by various facilities starting from regulations, guidelines, and procedures both from the ministry and university. The curriculum development is also maintained by appropriate funding learning facilities, organizational activities, monitoring and evaluation, and follow-up.

The programme curriculum has undergone several reviews. These reviews are conducted to ensure the compliance and relevance to the development of science, university, and professional associations, suggestions from alumni and stakeholders, and job market requirements. All the curriculum overviews can be seen in (Appendix 1.2). The freedom of learning policy provides opportunities for students to have Independent Learning Activities Course (MBKM) 20 credits hours which has been included in the curriculum.

1.3.1 The Curriculum of Chemistry Study Programme

The curriculum contents in the Chemistry study programme (Appendix 1.2.1) are designed to realize the vision, mission, goals, and objectives of the Chemistry Study Programme, Faculty of Mathematics and Natural Sciences, and the vision and mission of the

UNJ. It is made to meet the expected outcomes, formulated based on input and intensive communication with stakeholders, such as industrial and governmental institutions, and has generated quality graduates.

The curriculum structure has been designed and aligned with the Programme Learning Outline (PLO). The details of curriculum structure mapping towards PLO attainment can be seen in Table 1.19. In the curriculum mapping, every class supports specific competencies. Expected competency for each course for the graduates, as given in the competency map (Figure 2.1).

The correlation among the branches in chemistry: physical chemistry, analytical chemistry, organic chemistry, inorganic chemistry, and biochemistry was fully formulated in designing this curriculum. Vertically, introductory chemistry, physical chemistry, and analytical chemistry were given at the beginning of the study to create a good foundation for learning organic and inorganic chemistry courses. The courses related to the applied chemistry developing in the Chemistry study programme are added in the optional courses. With this plan, the graduates are expected to apply chemistry in their job and solve problems in other chemistry-related fields.

The curriculum of the programmes has undergone several reviews. These reviews are conducted to ensure the compliance and relevance to the development of science, regulation of the university and professional associations, the suggestion from alumni and stakeholders, and job market requirement

The process of achieving the expected qualification profile is carried out through the main programme lecture activities with a minimum number of 144 credits equivalent to 212 ECTS. Learning activities can be completed within eight semesters but no more than 14 semesters.

Curriculum structure The Chemistry study programme consists of 5 groups of course (Group of General Courses or MKU, University and Faculty characteristic courses, Study Programme features consist of Compulsory Courses and Elective Courses) and MBKM that must be completed during a minimum study period of 8 (eight) semesters and a maximum of 14 (fourteen) semesters with a credit unit range of 144 credits. Table 1.17 presents the curriculum and credits a bachelor's degree.

Table 1. 17 Course structure in terms of obligations

No	Types of Courses	Total (In Credits)	Total (In ECTS)
1	University's Courses	14	21.0
2	Faculty's course	1	1.5
3	Compulsory Courses	105	157.5
4	Elective Course	4	6.0
5	Independent Learning Activities Course (MBKM)	20	30.0
Total		**144**	**216.0**

As mentioned above, to earn a B.Sc. degree in Chemistry, a candidate must pass at least 144 credit hours, consisting of compulsory and optional or elective courses, and write a final project (Thesis) based on research in chemistry. The compulsory courses (55 courses/120 credit hours) give general and basic competency for a chemistry bachelor's degree. The optional courses offered to the students consist of 24 courses, including MBKM (overall 58 credit hours). The student can choose 18 credit hours from the 58 credit hours offered. The elective courses give additional competency to the students. The elective courses are grouped into a more specific field of study. The final project has to be finished by research in the laboratory and written in the final project report called undergraduate thesis (in Indonesian, this is called skripsi).

B.Sc. guarantees a balance between courses offered by the study programme. The course distribution is hierarchically arranged, which illustrates that the semester courses above extend courses from the previous semester. The distribution is based on the relationship between concepts, levels of knowledge, and course mapping that some of the upper semester courses have the preconditions in the previous semester. The 8th-semester students no longer take theoretical courses but take thesis for six months. For this reason, students are expected to complete their degree in the 8th-semester.

The curriculum is developed through processes from the body of knowledge to curriculum structure. Courses are designed from the core subject matter. The curriculum structure will guide students to achieve competencies that have been set and meet the PLO of the Chemistry Programme. Intended competencies that students can acquire after taking one course can be seen from the course module. Table 1.18 below describes the subject matter and course in the Chemistry Study Programme.

Table 1. 18 Body of Knowledge of Chemistry Study Programme

Code	Subject Matter	Descriptions	Course
SM1	Religion, character education, and behavioural science	To understand and resolve humanitarian and social problems based on religious beliefs related to education and social and community interactions.	1. Religion 2. Pancasila 3. Citizenship 4. Logic and Scientific Reasoning 5. Big Data and Programming 6. Introduction to Education 7. Olympism 8. Entrepreneurship
SM2	HSE (Health Safety Environment) laboratory and environmental education	To understand work safety, ethics, environmental issues, and policies related to the chemical field	1. HSE (Health, Safety Environment) laboratory 2. Environmental Education
SM3	Mathematics and Basic Science	To understand the basic principles of science and mathematics for solving various chemical problems	1. Basic Chemistry I 2. Basic Chemistry II 3. Practicum of Basic chemistry 4. Basic Physics 5. Practicum of Basic Physics 6. General Biology 7. Mathematical Chemistry
SM4	Scientific literacy and communication	To understand the analysis of research information and data (literacy) and communicate it to the public orally and in writing,	1. English 2. Indonesian 3. Chemistry Seminar 4. Pre-Thesis Seminar

Code	Subject Matter	Descriptions	Course
		both scientifically and popularly	
SM5	Chemistry (organic chemistry, inorganic, analytical, physical, and Biochemistry)		1. Chemical Thermodynamics 2. Organic chemistry 3. Atomic Structure and Structure of Inorganic Compounds 4. Qualitative and Quantitative Chemical Analysis 5. Practicum of Qualitative and Quantitative Chemical Chemistry 6. Chemical Kinetics 7. Organic compound Reaction 8. Practicum of Organic chemistry 9. Basics of Inorganic Reactions 10. Structure and Function of Biomolecules 11. Separation Chemistry 12. Practicum of Physical chemistry 13. Biomolecular Metabolism 14. metal and non-metal chemistry 15. Practicum of Biochemistry 16. logic and scientific reasoning 17. Practicum of Instrumental Chemical Analysis & Separation 18. Quantum chemistry 19. Practicum of Inorganic chemistry 20. Transition Metals and Coordination Chemistry 21. Research Methodology & Statistics 22. Molecule Spectroscopy
SM6	Chemical instruments and analysis of data and information	To understand the characterization technique with various spectroscopic tools and analyze the spectroscopic data for the elucidation of the structure	1. Instrumental Chemical Analysis 2. Material characterization method 3. Molecular Structure Elucidation

Code	Subject Matter	Descriptions	Course
	from these instruments	of organic molecules /materials	
SM7	Bioscience & Material chemistry	To understand the applied science of organic, inorganic materials, and the structure of a chemical substance	1. Bioscience 2. Material chemistry
SM8	Internship, Final Project, Community Service Programme	To understand the process towards professional life in academic, research, industrial and entrepreneurial environments that are relevant to the field of chemistry	1. Internship 2. Community Service Programme 3. MBKM
SM9	Thesis	To understand how to solve science and technology problems in the field of chemistry by applying relevant methods and technologies	Thesis

The curriculum structure mapping towards PLO of the Chemistry Study Programme is presented in Table 1.19.

Table 1. 19 Curriculum structure mapping towards PLO of Chemistry Study Programme

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

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

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

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

1.3.2. The Curriculum of the Biology Study Programme

The current curriculum applied by the Bachelor of Biology programme (Appendix 1.2.2) was developed based on the decree of the Higher education ministry of research and technology Indonesia Number 44, 2015. The curriculum was arranged based on the Learning outcome set before. Curriculum updates and improvement development were designed regarding IQF, graduates, National standard of higher education, Biology Consortium of Indonesia considering orientation changes of 4.0 industrial era and OBE. Programme outcomes are also designed to meet the development of science, technology, and global culture that cannot be separated from the development of the capacity potential of human resources owned by the biology programme.

The curriculum is developed through processes from the body of knowledge to curriculum structure. The curriculum structure will guide students to achieve competencies that have been set and meet the PLO of Biology Programme. Intended competencies that students can acquire after taking one course can be seen from the course module. Courses are designed from the core subject matter. Table 1.20 below describes the subject matter and course in the biology programme.

Table 1. 20 Body of Knowledge of Biology Study Programme

Code	Body of Knowledge (BK)	Course Review Description	Course Name (relevant with BK)
SM1	Cell And Molecular Biology	Its learning materials include biochemistry, cell biology, and molecular biology to understand the structure and function of cells. Cell biology study is related to the structure and function of eukaryotic cells, biosynthesis of cellular membranes and organelles, cell growth, transport, receptors, and cell signalling, cytoskeleton, extracellular matrix, chromosomal structure, concepts of DNA, RNA, and DNA	**Compulsory course:** Biochemistry and Organic chemistry, Cell Biology and Molecular Biology **Elective courses:** Bacteriology, Bakteriologi, Biology of

Code	Body of Knowledge (BK)	Course Review Description	Course Name (relevant with BK)
		synthesis. Molecular Biology considers prokaryotic genetic recombination, transcription from DNA to RNA, protein translation. Control of genes expression in prokaryotes and eukaryotes. Basic Molecular Technique-DNA Isolation. Genetic Markers (Hybridization, PCR, Sequence)	Yeast, Enzymology, Proteomic
SM 2	Physiology	The learning materials are about animal and plant physiology. Animal physiology course discusses the principles, processes, and mechanisms involved in biological function in animals, the cellular basis of animal physiology with consideration on the physiology of homeostasis, the endocrine and reproductive system, osmoregulatory, and digest system in the animal. This plant physiology course discusses an introduction to the structure of plant biomolecules, plant metabolism, and the physiological processes that underlie germination of seeds, plant growth and development, and the response of plants to the environment.	**Compulsory course:** Plant Physiology, Animal Physiology **Elective courses:** Animal Bioreproduction, Human Biology, Immunology, Ecto dan Endoparasyt, Animal Endocrinology, Laboratory Animal Management
SM 3	Genetics	Genetics course elaborates the fundamental principles of inheritance at cellular, organismal, and population levels. It studies how physical characters are inherited and how chemical structures affect them and pass them to the offspring. This field also studies DNA as the genetic material of an organism, synthesis protein and how material genetics and environmental controls phenotypic characters of organisms, and how changes in the DNA sequence cause of mutation result in variation within individuals and populations of species, leading towards evolutionary changes. It also introduces plasmid recombinant technology that utilizes biological systems, living organisms, or parts to develop or create different products.	**Compulsory course:** Genetics, Biotechnology **Elective courses:** Population Genetics, Conseravation Genetics, Animal Biotechnology, Plant Biotechnology, Reproduction and Plant Breeding
SM 4	Structure And Development (Plant and Animal)	The learning materials include plant and animal structures and development. The study material for plants discusses the external (morphology) and internal (anatomy) structures and development of	**Compulsory course:** Plant Structure and Development, Animal Structure, and Development,

Code	Body of Knowledge (BK)	Course Review Description	Course Name (relevant with BK)
		higher plants. It also discusses the development of the primary and secondary structures of plants. Plant growth and development in the vegetative and generative phases. Embryogenesis and organogenesis of the plant. The study material for the structure and development of animals discusses the histological structure of fundamental tissues and specific tissues that make up an animal organ and explains the internal structures and processes of the formation and development of various organ systems in vertebrates. The development of animals also discusses the transitional or indirect stages of development in some vertebrates, mechanisms of metamorphosis, and regeneration.	Plant Tissue Culture, Microbiology **Elective courses:** Animal Histology, Animal Microtechnique, Teratology, Plant Microtechnique, Botany Economic, Urban Biodiversity, Principals of Horticultura, Plant Microbial Pathogens
SM 5	Biosystematic And Evolution	Biosystematics is the study of the diversification of organisms and the relationships between these organisms. Biosystematics includes the subdisciplines of taxonomy and systematics. Taxonomy includes discovering species, identification, diagnosis, comparison, classification, and naming. Systematics studies the evolutionary relationships between species and higher taxonomic units (such as genera and families) in an evolutionary relation. The biology systematics also discussed the biodiversity of living things, including plants (cryptogam and phanerogams), animals (vertebrate and invertebrate), bacteria, algae, fungi, and their implementation in the classification of living things and their conservation aspects.	**Compulsory course:** Biodiversity and Systematics of the Cryptograms, Biodiversity, and Systematics of the Phanerogams, Biodiversity, and Systematics of the Vertebrate, Biodiversity, and Systematics of the Invertebrate, Evolusi. **Elective courses:** Biodiversity of Fungi, Biosistematic of Microorganisma, Phucology, Orchidology, Pteridology
SM 6	Ecology	Ecology is the study of the interactions between organisms and their environment. Ecological is a biological science that studies the interactions between living things and other living things and the surrounding environment. This course provides a background in the principles of ecological science, concepts of natural selection, population and community	**Compulsory courses:** Environmental Sciences, Fundamentals of Ecology, Field Works. **Elective courses:** Animal Ecology, Plant Ecology, Ornithology,

Code	Body of Knowledge (BK)	Course Review Description	Course Name (relevant with BK)
		ecology, biodiversity, and sustainability. The constantly changing environment also encourages living organisms to continue to adapt. This study, it is also discussing various natural resources in the background and their management	Biogeography, Limnology, Environmental Microbiology, Plant Ecophysiology, AMDAL
SM 7	Data Analysis	The focus of the study is the use of several tools for data analysis of scientific research in plants, animals, microbiology, and related fields of science. This study also discusses descriptive and experimental methods and designs for scientific research—analytical techniques and dissemination of the results obtained in the final project.	**Compulsory course:** Basic Mathematics, Basic Statistics, Biological Research Methodology, Research Design, Internship programme, Fieldworks, Thesis **Elective courses:** Fundamentals of Bioinformatics
SM 8	Management Based on Biology	This subject matter covers the material on how to organize works in the laboratory, manage works in various fields related to biological products and write a report for the final project	**Compulsory course:** Occupational and Health Safety, Entrepreneurship in Biology, Techniques on Scientific Writing, Seminar on research proposal **Elective courses:** Animal Bio etic

The learning process conducted in the classroom, laboratory, and outside the field area includes internship partners of industry and research boards. During the last three years, classroom activities involved the classes organized by the biology programme, mathematic and natural science faculty, Universitas Negeri Jakarta, and other open class from other institutions as a form of Indonesian freedom to learn. Some partner universities were incorporated in the PERMATA SAKTI and PERMATA AMLI programme, University to university agreements with Universitas Indonesia, Universitas Jenderal Soedirman, and Universitas Padjadjaran. Students are allowed to have 20 up to 40 credits from other Universities in 1 (one) - 2 (two) semesters.

The total number of credits required for the compulsory subject is 144 credits with seven up to 14-semester lengths. Courses are categorized into 14 general courses, 93 basic skills courses, and 37 courses in expertise and support. Course distribution for every semester is supported in Table 1.22. One credit equals 170 minutes of learning activities per week for one semester. One semester consists of 16 meetings, including mid-test and final tests. The curriculum structure is designed in 5 major Courses: University Courses – National Compulsory and University Compulsory (14 credits), Faculty's Courses (1 credit), Basic Skills

Course (92 credits), Study Programme Elective Courses (17 credits), Independent Learning Activities Course (MBKM) (20 credits). Subject and Workload of Curriculum of Biology Study Programme is shown in Table 1.21.

Table 1. 21 Groups of Subject and Workload of Curriculum of Biology Study Programme

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

Note: 1 credit (50 minutes of structured learning, 60 minutes of structured assignment, 60 minutes of independent learning) equal to 1.5 ECTS

A review of the suitability of the curriculum and its implementation is carried out in the form of curriculum monitoring, evaluation activities carried out at the end of the semester, and monitoring and evaluation of learning in the middle of the semester (8th week of lecture). Students also score and value learning processes through Lecturers' evaluations, which will directly inform every lecturer after the course. The quality assurance unit at the study programme, Faculty, and University level carried out internal monitoring and evaluation activities.

To guarantee that the students understand the programme learning outcomes of degree programmes and courses, the lecturer will give module handbooks at the beginning of the system meets as a contract. The description of learning goal courses has been written in the module. The module is used as a help to describe knowledge, skills, and competencies acquired in the classes. Lecturers have written the description of learning outcomes of the courses of respective courses. The matrix between Course Learning Outcomes (CLO) and Programme Learning Outcomes (PLO) of the Biology Study Programme is shown in Table 1.22

Table 1. 22 Curriculum structure mapping towards PLO of of Biology Study Programme

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

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

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

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

1.3.3 The Curriculum of Chemistry Education Study Programme

The Curriculum of Chemistry Education Program (Appendix 1.2.3) refers to the Indonesian National Qualifications Framework (KKNI), Standard of Higher Education, and Indonesian Chemical Society in 2017 and 2021. Besides, in 2020, the Ministry employs MBKM (Freedom to learn) policy, which allows students to take the opportunity to study and practicum in the fieldwork. In the form of lecture activities in the classroom, laboratory, and fieldwork, the total number of credits of 145 credits. In the new policy of MBKM, the study program integrates several programs that involve eight programs of students' exchange, teaching assistant, independent research, fieldwork in industry, community services program (KKN), humanity program, independent study, and entrepreneurship. Then there are the structure of credits as described in Table 1.23 below.

Table 1. 23 Groups of Subjects and Workload of Curriculum of Chemistry Education Study Programme

No	Types of Courses	Total (In Credits)	Total (In ECTS)
1	University's Courses	14	21.0
2	Faculty's course	1	1.5
3	Pedagogy's courses	7	10.5
4	Study Programme's Compulsory Courses	99	148.5
5	Elective Course	4	6.0
6	Independent Learning Activities Course (MBKM)	20	30.0
Total		**145**	**217.5**

Chemistry education integrates chemistry philosophy and education that unites the characteristics of chemistry and education to produce a body of knowledge from chemistry education. Chemistry education is closely related to the philosophy of chemistry related to the attributes of chemistry. Therefore, the curricula consist of multidiscipline, interdisciplinary, and

transdisciplinary approaches of chemistry and education and its relevance body knowledge. Chemistry itself as subject knowledge consists of Organic Chemistry, Inorganic Chemistry, Biochemistry, Physical Chemistry, and Analytical Chemistry. Then, the field of education includes curricula, students' characteristics, teaching methodology, learning media, assessment, and evaluation. Therefore, the curricula consist of four cores Subject Matter (SM) in Table 1.24 below.

Table 1. 24 Subject Matter (SM) of Chemistry Education Study Programme

Code	Subject Matter	Descriptions	Course
SM1	General and Supporting Knowledge	Studies that develop competencies as individuals, professionals, and citizens and globally. A study that facilitates students to have the skills to think, collaborate, communicate, practice, and act scientifically to adapt to changes, especially in chemistry education.	1. Religion 2. Pancasila 3. Citizenship 4. Indonesian Language 5. Logic and Scientific Reasoning 6. Big Data and Programming 7. Introduction to Education 8. Olympism 9. English 10. Entrepreneurship 11. Environmental Education 12. Research Methodology 13. Statistics
SM2	Didactic Pedagogy	Studies in education develop didactic pedagogical skills in planning, implementing, and evaluating learning in the classroom and the laboratory. Studies that develop following advances in science and technology	1. Learners Development 2. Teaching and Learning Theory 3. Basic of Education 4. Planning and Learning Management 5. Chemistry Curriculum 6. Teaching Methodology 7. Assessment and Evaluation 8. Learning Media 9. Health Safety and Environment Laboratory
BK3	Mathematics and Basic Science	Studies that describe the basic concepts of science, mathematics, matter, and the fundamental laws of chemistry in various reactions in solving problems	1. Basic Chemistry I 2. Basic Chemistry II 3. Practicum of Basic chemistry 4. Basic Physics 5. Practicum of Basic Physics 6. General Biology 7. Practicum of General Biology 8. Mathematical Chemistry

Code	Subject Matter	Descriptions	Course
BK4	Chemistry	Studies on the basic concepts and applications of chemistry are divided into Organic Chemistry, Inorganic Chemistry, Physical Chemistry, Analytical Chemistry, Biochemistry, and Environmental Chemistry in a comprehensive based on scientific references.	1. Chemical Thermodynamics 2. Organic Chemistry 3. Practicum of Organic Chemistry 4. Atomic Structure and Structure of Inorganic Compounds 5. Quantitative and Qualitative Analytical Chemistry 6. Practicum of Qualitative and Quantitative Chemical Analysis 7. Chemical Kinetics 8. Practicum of Physical Chemistry 9. Basic Inorganic Reactions 10. Chemical Separation 11. Organic Compound Reaction 12. Transition Metal and Complex Compound 13. Practicum of Inorganic Chemistry 14. Structure and Function of Biomolecules 15. Quantum Mechanics 16. Metal and Non-Metal Chemistry 17. Instrumental Chemistry 18. Practicum Instrumental and Separation 19. Biomolecular Metabolism 20. Practicum of Biochemistry

Table 1. 25 Curriculum structure mapping towards PLO of Chemistry Education Study Programme

Course code	Course Name	CP	ECTS	PLO										
				1	2	3	4	5	6	7	8	9	10	11
Semester 1														
0051142	Indonesian Language	2	3.0	v										
0051122	Pancasila	2	3.0	v	v									
0053074	Basis of Education	3	4.5		v									
33150023	Basic Chemistry I	3	4.5	v		v								
30055043	Basic Physics	2	3.0	v		v								
32251012	Practicum of basic Physics	1	1.5	v		v					v			
33154031	General Biology	2	3.0	v		v								
33154062	Practicum of General Biology	1	1.5	v		v					v			
33154071	Mathematical Chemistry	3	4.5	v		v								
33150842	Olympism	1	1.5		v									
	Total CP	**20**	**30**											

Course code	Course Name	CP	ECTS	PLO										
				1	2	3	4	5	6	7	8	9	10	11
Semester 2														
	Introduction to Education	2	3.0	v	v									
0052033	Religion	2	3.0	v										
0052152	Learners Development	2	3.0	v				v						
00051062	Citizenship	2	3.0	v	v									
33151542	Planning and Learning Management	2	3.0	v	v			v						
33150033	Basic Chemistry II	3	4.5	v		v								
	Practicum of Basic Chemistry	2	3.0	v		v					v			
33154143	Environmental education	3	4.5		v						v			
33150312	HSE (Health Safety and Environment) Laboratory	2	3.0	v	v						v			
	Total CP	**20**	**33**											
Semester 3														
	Big Data and Programmeming	2	3.0		v				v	v				
0052144	Learn and Learning Theory	2	3.0	v				v		v				
30055053	Atomic structure and structure of inorganic compounds	3	4.5	v			v							
33151324	Organic Chemistry	4	6.0	v			v							
33150933	Chemical Thermodynamics	3	4.5	v			v							
33150893	Qualitative and Quantitative Chemical Analysis	3	4.5	v			v							
33154212	Practicum of Qualitative and Quantitative Chemical Analysis	2	3.0	v			v				v			
	Total CP	**19**	**31.5**											
Semester 4														
	Logic and Scientific Reasoning	3	3.0		v				v					
33154263	Chemistry Curriculum	4.5	4.5		v			v						v
30052012	Learning Methodology	3	3.0		v			v				v		
30055082	Basics of Inorganic Reactions	3	3.0	v			v							
33150983	Chemical Kinetics	4.5	4.5	v			v							
33250232	Chemical Separation	4.5	4.5	v			v				v			
33250053	Research methodology	4.5	4.5		v				v			v		
33150172	Practicum of organic chemistry	3	3.0	v			v				v			
	Total CP	**20**	33											
Semester 5														
	Assessment and Evaluation	3	4.5		v			v				v		
	Metal and Non-Metal Chemistry	3	4.5	v			v							
33150682	Practicum of Inorganic Chemistry	2	3.0	v			v				v			
	Quantum Mechanics	3	4.5	v			v							
33250343	Structure and Function of Biomolecules	3	4.5	v			v							
33154083	Statistics	3	4.5		v				v			v		
33150041	Practicum of Physical Chemistry	1	1.5	v			v				v			
	Organic Compound Reaction	4	6.0	v			v							
	Total CP	**22**	**33**											
Semester 6														
33151192	Microteaching	2	3.0	v				v		v				
	Transition Metals and Complex Compounds	2	3.0	v			v							
33250333	Instrumental Chemistry	3	4.5	v			v							
	Practicum of Instrumental Chemistry and Separation	2	3.0	v			v				v			
33151093	Biomolecular Metabolism	3	4.5	v			v							
	Practicum of Biochemistry	2	3.0	v			v				v			
33250632	Chemistry Education Seminar	2	3.0		v		v	v	v	v		v		
	Elective Course	4	3.0		v		v	v		v			v	v
	Total CP	**20**	**30**											
Semester 7														

Course code	Course Name	CP	ECTS	PLO										
				1	2	3	4	5	6	7	8	9	10	11
MBKM														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055032	Practice Teaching Skills	6	9.0	v			v	v		v	v			v
	University/Elective Courses/MBKM	12	18.0											
	Total CP	**20**	**30**											
semester 8														
30054024	Thesis	4	6.0		v		v	v	v	v		v		
	Total CP	**4**	**6.0**											
	TOTAL CREDITS	**145**	**217.5**											
Elective Courses														
33150952	Entrepreneurship	3	3.0	v	v								v	
33154092	Learning Media	2	3.0		v			v		v				
30050042	English	2	3.0	v	v									
33150012	Medical Biochemistry	2	3.0	v			v							
33150462	Biotechnology	2	3.0	v			v							
33151482	Chemicals of Natural Product	2	3.5	v			v							
33151492	Elucidation Molecular Structure	2	3.0	v			v							
33250362	Nanoscience and Nanotechnology	2	3.0	v			v							
33150282	Polymer Chemistry	2	3.0	v			v							
33150272	Environmental Chemistry	2	3.0	v			v							
33154322	Green Chemistry	2	3.0	v			v							
33151332	History of Chemistry and Chemistry Education	2	3.0		v			v		v				
33151342	Science Learning	2	3.0	v		v		v						
33151392	Science Technology Engineering Mathematics (STEM)	2	3.0		v			v		v				
33154202	Computer	2	3.0		v			v						
33151422	Ethnopedology	2	3.0	v	v			v		v				
33151432	Chemistry for Children with Special Needs	2	3.0	v	v			v		v				
33151452	Qualitative Research Methodology	2	3.0		v				v					
33154302	Learning Environment	2	3.0		v				v					
33154272	Misconceptions in Chemistry Learning	2	3.0		v			v		v				
33154312	Instrument Development	2	3.0		v			v	v	v				
33151442	ICT in Learning Chemistry	2	3.0		v			v		v				
33151402	Important Concepts in Chemistry	2	3.0		v			v		v				
3151382	School Management	2	3.0	v	v			v		v				
MBKM (20 credits)														
Option 1														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055032	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	University Courses	12												
Option 2														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055032	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	Elective Courses	12												
Option 3														
30052072	PreThesis Seminar	2	3.0		v		v	v	v	v		v		
30055032	Practice Teaching Skills	6	18.0	v			v	v		v	v			v
	MBKM (8 programmeme)	12												

1.3.4 The Curriculum of Biology Education Study Programme

The curriculum was designed to undergo visions, missions, and goals of the Biology Education Study Programme, Faculty of Mathematics and Natural Sciences (FMIPA), UNJ in terms of generating a graduate as a teacher/an educator in biology who also can manage a laboratory as well as entrepreneurship according to recent time and stakeholders. The curriculum structure (Appendix 1.2.4) was arranged in line with Programme Learning Outcome (PLO) description, explicitly found in Table 1.14. The curriculum mapping figure has explained the relationship between each course name and course subject of study from the Biology Education study programme and can be seen in Figures 1.11 and 1.12.

The curriculum of Biology education was arranged to provide the graduate's need for knowledge and skills in teaching and learning education and biological science. Therefore, the curriculum generally has four main course subjects. The first-course subject is to support religious ability, character-building education, and behavioural sciences; the second-course issue is to support skills and skills in Biology Education; the third-course subject is to support professional skills and unique skills in Biology Education, and the fourth-course subject is to support entrepreneurship in Biology Education. The specific explanation of the relationship between course subjects and course names in the curriculum can be seen in Table 1.26

The students of the Biology Education Programme complete their study in 4 years (8 semesters) length of study as the fastest period and seven years (14 semesters) length of study as the most extended period. The courses they have to complete during the study programme are a minimum of 144 credits or equals 200 ECTS. The course groups include general courses with 15 credits (22.05 ECTS) that are compulsory for all students from the university. Introductory education courses with ten credits (14.7 ECTS) as mandatory courses for students who are in the Education programme; biology courses with 77 credits (113.19 ECTS); learning courses with 12 credits (17.64 ECTS) to support the students as teachers or educators in biology study programme; and elective courses with 30 credits (44.1 ECTS) both in applied biology or professional education courses.

Table 1. 26 Course Groups and Course Weight in Curriculum of Biology Education Study Programme

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

***)** for Education Study Programme only

**) total of minimum credits

The body of knowledge of the Biology Education Study Programme is presented Table 1.27 below.

Table 1. 27 Body of Knowledge of Biology Education Study Programme

Course Category	Subject Matter (SM)		Course Description	Course Name
Religious Skill, Character Building Education, and Behavioural Science	SM 1	Religion, character-building education, and behavioural science	To support the abilities of understanding religions, characters in the society and nationality, and scientific attitudes.	● Religion ● Pancasila ● Philosophy of Natural Science ● Citizenship ● Social Science and Cultures ● Olimphism
Knowledge and Skills in Biology Education Study Programme	SM 2	Mathematics and Basic Sciences	To understand the concept of biology and its relations with natural sciences (IPA). Some courses support the students to have biology literacy and scientific skills.	● Basic Mathematics ● Basic Physics ● Practicum of Basic Physics ● Basic Chemistry ● General Biology ● Practicum of General Biology
	SM 3	Occupational Healthy and Safe (K3) and Environmental Science	To understand basic knowledge and skill of laboratory management and environmental issues.	● Management of Laboratorium ● Education of Environment Science
	SM 4	Scientific Literacy and Communication	To understand the analysis of research information and data (literacy) and communicate it to the public.	● Bahasa Indonesia ● English ● Biology Education Seminar
	SM 5	Biology Cells and Molecules	To understand the structure and function of the cell membrane, membrane transportation, cell communication, structure and cell organelle function in endomembrane system (endoplasma reticulum and Golgi body), ribosome, mitochondria, chloroplast, vacuole, and micro-body.	● Biochemistry ● Biology Cell
	SM 6	Growth and Development Structure	To understand the microscopic structure (histology) and macroscopic (anatomy), and the growth of animal and plant, growth control substance, plant movement, photoperiodism, vernalization, morphology/anatomy of root, stem, leaves, flowers, fruits, seeds, embryos, and sprouts, and also semi-technical description which is distinct in several families of plants. This course also discusses reproduction organs and gametogenesis, fertilization,	● Structure of Animal Development ● Practicum of Structure of Animal Development ● Structure of Plant Development ● Practicum of Structure of Plant Development

Course Category	Subject Matter (SM)		Course Description	Course Name
			regeneration and metamorphosis, cleavage, MEE and placenta, the control mechanism of core and cytoplasm, and also a hormone in organ development, organ development in integument system and its derivative, muscle system, digestion system, distribution system, respiration system, urogenital system, neuron system, sensory system, and hormone system as well as comparison of anatomy.	
	SM 7	Biosystemics and Evolutions	To understand the botanical variation of cryptogam, taxonomy, systematics, distribution, and utilization. The learning materials include basics of taxonomy; 5 kingdoms classification system; polyfiletisme of cryptogam, psychology, mycology, lichenology, bryology, and pteridology; ecology, utilization, and conservation of cryptogam members.	● Cryptogam Botanicals ● Practicum of Cryptogam Botanicals ● Fanerogam Botanicals ● Practicum of Fanerogam Botanicals ● Vertebrate Zoology ● Practicum of Vertebrate Zoology ● Avetebrate Zoology ● Practicum of Avetebrate Zoology ● Evolutions
	SM 8	Physiology	To understand the concept of Biomembrane, Bioelectricity, Muscles Contraction, Neuron System and Senses, Hormone System, Bones, Digestion System, Respiration System, Circulation System Excretion System and Osmoregulation, ReproductionSystem and Thermoregulation.	● Animal Physiology ● Practicum of Animal Physiology ● Human Anatomy Physiology ● Practicum of Human Anatomy Physiology ● Plant Physiology ● Practicum of Plant Physiology
	SM 9	Genetics and Biotechnology	To understand molecular genetics, such as genetics material, regulation of gene expression, mutation, cancer, and classical genetics: heredity, Mendelism, probability and Chi-Square statistic analysis, allelic and gene interaction, gender determination, gene embedded sex, linkage, cross-movement, and chromosome map, extranuclear gene phenotypic, and population genetics.	● Genetics ● Practicum of Genetics ● Microbiology ● Practicum of Microbiology
	SM 10	Ecology and Environment	To understand ecology concepts and their ecosystem	● Ecology ● Practicum of Ecology

Course Category	Subject Matter (SM)		Course Description	Course Name
			obstacles, including internal interaction in micro or macro scales.	• Excursion Study
	SM 11	Foundation of Biology Education	To prepare the students to understand and implement the philosophy, basic principles of education, especially Biology, include learning theories, student development, planning, implementation, and learning evaluation.	• Foundation of Education • Students Development • Theory of Learning and Teaching • Curriculum Analysis • Learning Methodology • Learning Plan and Evaluation
Professional Ability and Specific Skill in Biology Education	SM 12	Professional Skills in Biology Education	To understand the skills for teacher candidates who can apply the learning theory and practicum of education in laboratory and classroom so that they are going to be professional teachers.	• Educator and Educational Staff Profession • Learning Competency Development • School Management and Development
	SM 13	Laboratorium Management	To understand the foundation of law in Biology Laboratorium for High School, working safety in the laboratory, laboratory tools and materials management, laboratory administration, tools, and material procurement, biology laboratory design for High School laboratory observation of laboratory, and future development of biology laboratory for High School	• Universal Data and Programming • Excursion Study • Biotechnology
	SM 14	Scientific Research and publication.	To review the basic concept of statistics and research in education, research paper writing techniques (APA, Vancouver, and Turabian style), Mendeley application, SPSS application, Turnitin application, plagiarism, national and international research journal, predator journal, etc. scientific writing projects.	• Logic and scientific analysis • Fundamental Statistics • Research Methodology • Pra-Thesis Seminar • Thesis
Entrepreneurship	SM 15	Management and Entrepreneurship	To review some courses, such as the foundation of management, school management, strategic management, history of entrepreneurship, and supporting factors of entrepreneurship.	• Biology and Microbiology Based Entrepreneurship • Applied Microbiology

Table 1. 28 Curriculum structure mapping towards PLO of Biology Education Study Programme

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

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

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

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

1.3.4 The Curriculum of Master of Chemistry Education Study Programme

The curriculum structure (Appendix 1.2.5) is designed to realize the vision, mission, goals, and objectives of the master's Programme of Chemistry Education, the Faculty of Mathematics and Natural Sciences, and the vision and mission of UNJ. The curriculum is made to meet the expected results, formulated based on input and intensive communication with stakeholders, such as educational institutions and the government, to produce quality graduates.

The curriculum structure has been designed and aligned with the Programme Learning Outcomes (PLO). Each course is closely related to achieving the established PLO. In general, there are 19 courses and one final project/thesis to accomplish all 8 PLOs that have been set. The courses are grouped into available courses, competence courses, and elective courses. General courses consist of 9 credits, competence courses include 37 credits, and elective courses include eight credits. The minimum number of credits that students must take is 46 credits or the equivalent of 119.6 ECTS. Nineteen courses are distributed in 3 semesters, and the thesis project is in the fourth semester.

The Chemistry Education Master's Programme curriculum is based on the Indonesian Qualifications Framework (IQF) Level 8. In revitalizing the curriculum, we involve the suggestions of graduate users, discussions with all lecturers, and conduct a situation analysis of the needs of the world of work. This effort ensures conformity and relevance to scientific developments, university regulations and professional associations, suggestions from alumni and stakeholders, and the job market's needs.

Table 1. 29 Course Structure of master's degree of Chemistry Education Study Programme

No	Types of Courses	Total (In Credits)	Total (In ECTS)
1	University's Courses	9	23.4
2	Compulsory Courses	36	93.6
3	Elective Course	2	5.2
Total		**47**	**122.2**

The curriculum of Master of Chemistry Education is arranged based on the learning achievements completed by the students to get the master's degree in Chemistry Education. The learning achievements (ILC/CPL) and the course review connection are specific courses required by the students. The following table presents which course category is relevant with its course review and PLO:

Table 1. 30 Body of Knowledge of master's degree of Chemistry Education Study Programme

Code	Body of Knowledge (BK)	Course Description	Course Name (relevant to BK)
SM1	Basic General Ability	Ability to think critically and creatively, collaborate, communicate, computational thinking, solve the problem, show integrity and concern, and share ideas to advance chemistry education.	1. Philosophy of Science 2. New Orientation in Education 3. Research Methodology in Education 4. Statistics in Education 5. International Journal Review 6. Thesis Seminar 7. Thesis

Code	Body of Knowledge (BK)	Course Description	Course Name (relevant to BK)
SM2	Pedagogy Ability	To have competency in planning, implementing, and evaluating the learning process and arrange a set of learning activities and learning media with technology-information-base.	1. Analyzing and Implementing Chemistry 2. Information Technology in Chemistry 3. Measurement and Evaluation in Chemistry Education 4. Instructional Design and Curriculum Development of Chemistry Education
SM3	Acknowledgment of Chemistry Learning Material Ability	Ability to acknowledge chemistry learning material comprehensively and correctly based on reliable scientific literature review.	1. A misconception in Chemistry, fundamental Concept in Biochemistry and Organic Chemistry 2. Fundamental Concept in Physical Chemistry and Inorganic Chemistry 3. Fundamental Concept of Analytical Chemistry and Environmental Chemistry 4. Applied Chemistry 5. Green Chemistry 6. Chemical Instruments

Table 1. 31 Curriculum structure mapping towards PLO of master's degree in Chemistry Education Study Programme

Course Code	Course Name	CU	ECTS	PLO							
				1	2	3	4	5	6	7	8
Semester 1											
30061013	Philosophy of Science	3	7.8	v	v		v				
30062023	Educational Research Methodology	3	7.8		v					v	v
33361113	Chemistry Learning, Analysis, and Its Application	3	7.8		v		v	v	v		
33361032	ICT in Chemistry Learning	2	5.2		v		v	v	v		
33363014	Current Issues in Chemistry Education	4	10.4		v	v	v			v	
	Total CU	12	31.2								
Semester 2											
33363103	Educational Statistics	3	7.8		v					v	v
33362013	Chemistry Learning Design	3	7.8		v		v	v			
33362023	Chemistry Learning Evaluation	3	7.8		v			v	v		
33363063	Misconceptions in Chemistry	3	7.8		v			v		v	v
33361042	New Orientation in Education	2	5.2	v	v			v			
33361122	Academic Writing	2	5.2		v			v		v	v
33363103	Educational Statistics	3	7.8		v					v	v
	Total CU	**18**	**46.8**								
Semester 3											
33361082	Fundamental Concepts in Biochemistry and Organic Chemistry	2	5.2		v	v		v	v		
33361092	Fundamental Concepts in Physical and Inorganic Chemistry	2	5.2		v	v		v	v		
33361102	Fundamental Concepts in Analytical and Environmental Chemistry	2	5.2		v	v		v	v		
33363082	Seminar on Thesis Proposal	2	5.2		v	v	v	v	v	v	
33361062	Green Chemistry	2	5.2		v	v		v	v		
33363052	Applied Chemistry	2	5.2		v	v		v	v		

Course Code	Course Name	CU	ECTS	PLO							
				1	2	3	4	5	6	7	8
	Total CP	**12**	**31.2**								
Semester 4											
33363006	Thesis	6	15.6	v	v	v	v	v	v	v	v
	Total CP	**6**	**15.6**								
	TOTAL CREDITS	**49**	**127.4**								

1.3.5 The Curriculum of Master/s Degree of Biology Education Study Programme

Master of Biology Education curriculum (Appendix 1.2.6) is structured to meet the competence profile with current trends and future issues and the stakeholder of education. The curriculum criteria need to meet the user's needs in the biology education field. The concentration definition is based on education issues and development sectors to ensure students' competencies in biology education. The curriculum consists of 4 semesters which are presented in a curriculum map. The curriculum map is structured to correlate vision-mission with the programme learning outcomes. The curriculum map is structured into pedagogy, biology field, and Thesis Complex, where the courses have to be taken consecutively.

The Pedagogy and biology studies provide professional and practical exercises to an educator, researcher, public policies or biology education analyst. It is an estuary to all studied courses. At the same time, the thesis complex is designed to support the forming of intended graduate profiles as a researcher in biology education, curriculum developer, and public policy in biology education. Both research in public policies or academic research to develop theories. Below is the latest curriculum map of The Magister of Biology Education Programme.

Table 1. 32 Curriculum Structure of Master's Degree of Biology Education Study Programme

No	Course Group	Credits	ECTS
1	General Course	9	23.4
2	Compulsory Courses	29	75.4
3	Elective Courses	6	15.6
Total		44	114.4

Table 1. 33 Body of Knowledge of Master's Degree of Biology Education Study Programme

Code	Body of Knowledge (BK)	Course Description	Course Name
BK1	Science of Education (Pedagogy)	It elaborates the learning process starting from planning, implementing, and evaluating the lesson; the pedagogy competence is a competency that differentiates teachers from other professions. The teacher decides the level of success in the learning process and learning result.	1. Biology Learning Design 2. Biology Learning Evaluation 3. Education 4. Contemporary Issues of Biology 5. School-Base Management 6. Biology Learning Media 7. Neuroscience 8. Thesis Seminar 9. Online Learning Development 10. Scientific Publication
BK2	Review of Biology	It elaborates the science of living creatures required to	1 Ecology, Environment, and Conservation 2 Molecular Genetics and

Code	Body of Knowledge (BK)	Course Description	Course Name
	(Content)	develop the students' knowledge.	Biotechnology 3 Structure of Animal Development 4 Physiology of Animals 5 Structure of Plant Development 6 Physiology of Plants
BK3	General Review	It supports and connects to pedagogy and review of biology	● Philosophy of Science ● Statistics of Education ● Research Methodology

Table 1. 34 Curriculum structure mapping towards PLO of master's degree in Biology Education Study Programme

Course code	Course Name	CP	ECTS	PLO									
				1	2	3	4	5	6	7	8	9	10
Semester 1													
30081013	Philosophy of science	3	7.8	v	v		v						v
34181024	Design of biology instructional	4	10.4	v	v	v		v					
34182014	Genetic Molecular dan Biotechnology	4	10.4	v	v							v	v
34182033	Ecology, environment dan conservation	3	7.8	v		v						v	v
	Elective course 1	2	5.2		v	v		v					v
	Total CP	**16**	**41.6**										
Semester 2													
30082013	Statistic	3	7.8		v		v		v				v
30082023	Research Methodology	3	7.8		v		v		v				v
34182024	Evaluation of Biology learning	2	5.2	v	v					v	v		
34363072	Structure, Development, and Physiology	2	5.2	v	v							v	v
34363082	Structure, Development, and Physiology of animal	2	5.2	v	v							v	v
34182042	Contemporary issues of biology and biology education	2	5.2		v	v						v	v
	Elective course 2	2	5.2	v	v					v		v	
	Total CP	**18**	**46.8**										
Semester 3													
341831042	Biology learning tools	2	5.2		v	v				v			v
30083042	Thesis Seminar	2	5.2	v	v				v				v
	Elective course 3	2	5.2	v	v			v					v
	Elective course 4	2	5.2	v	v			v					v
	Total CP	**6**	**15.6**										
Semester 4													
30084024	Thesis	6	15.6	v	v	v	v	v	v	v	v	v	v
	Total CP	**6**	**15.6**										
	TOTAL CREDITS	**44**	**114.4**										

*) Optional elective course

Table 1. 35 List of Elective Courses of Master's Degree of Biology Education Study Programme

No.	Course Codes	Courses	CP	ECTS	Semester
1	34363022	Neuroscience	2	5.34	Available in every semester
2	34361022	Scientific Publications	2	5.34	
3	34261012	Bioinformatics in Biology Learning	2	5.34	
4	34363012	Information Technology in Biology Learning	2	5.34	
5	34363052	School Based Management	2	5.34	
6	34361032	Online Learning Development	2	5.34	
7	34361042	Applied Microbiology	2	5.34	
8.	34261002	Digital Learning Tools	2	5.34	
9.	34361052	Outdoor learning Model	2	5.34	

1.4 Admission Requirement

The quality improvement of students' recruitment at university has become the national need and policy. The attempt to quality improvement of students' recruitment at state university started in 1976 when five state universities allied in Secretariat of Partnership amongst Five Universities (SKALU) had done the students' recruitment together. Then, the SKALU system of recruitment had been developed into Perintis Project, New Students Recruitment System *(Sipenmaru),* Entrance Examination of State University (UMPTN), Selection of New Student (SPMB), and National Entrance Selection of State University (SNMPTN) in 2008.

In 2011 SNMPTN was developed into two patterns: recruitment based on tracing ability and academic achievement by using SNMPTN as the national selection system and selection pattern by writing exams, namely Collective Selection of State University Entrance (SBMPTN). In 2013-2020 there have been three recruitment methods: SNMPTN, SBMPTN, and Independent (Mandiri).

The attempt to improve the quality of recruitment has been based on the spirit of having student candidates by referring to their potential ability through propositional and fair selection. Therefore, the model and process of students' recruitment in State Univerisity of Jakarta (Universitas Negeri Jakarta/UNJ) are developed based on information and technology development, cyber technology, and the digitalization era. Society demands the competent output of higher education. Besides, society needs a test model and new student recruitment selection based on convenience, flexibility, and quality principles.

The process of student recruitment selection in UNJ is divided as follows:

a. Selection test that can predict the ability of student's candidate which can complete their study at university,
b. Competency test for the candidate of student who is going to continue their study to a specific study programme,
c. A permanent institution conducting the standardized test in the National region is crucial. It is required to establish one institution that can facilitate the test implementation continuously.

Forming the test institution have to be designed in detail, such as analyzing the global and national situation, developing an institution road map based on its function and valid regulation, identifying required resources, developing a reliable and ready-to-use test instrument up to an institution that is accurate, credible, proportional, efficient, and effective. The institution being described is the Institution of University Entrance Test (in the future is referred to as LTMPT), which can be seen on the webpage https://ltmpt.ac.id/.

LTMPT gives a positive perception to the society that: a) Indonesia will have a permanent institution serving a university entrance test based on the national standard; b) the test is implemented in several places and times with UTBK method (Computer-Based Writing Exam) by using Desktop; c) the candidate could access the test result transparently.

LTMPT was officially launched by the Minister of Research, Technology, and Higher Education of the Republic of Indonesia on 4th January 2019. The functions of LTMPT are to manage and process the students' candidate data as a reference of test selection with SNMPTN, SBMPTN, and UTBK. Thus, LTMPT is seriously expected to select student candidates who are predicted to complete their study at the university, especially at Universitas Negeri Jakarta. Besides, society is also expected to get more comforts and benefits. Meanwhile, the aims of LTMPT are as follows:

1. To perform a university entrance test that is credible, fair, transparent, flexible, efficient, and accountable.
2. To help the university to get student candidates who are predicted to accomplish their study programme based on academic scores or other achievements.
3. To get students candidates who are predicted to accomplish their study programme according to the test result from SNMPTN, UTBK-SBMPTN, and other criteria.

Foundations of Law of LTMPT are as follows:

1. The Law No. 20 the Year 2003 about National Education System;
2. The Law No. 12 the Year 2012 about Higher Education;
3. The Government Regulation No. 4 the Year 2014 about Implementation and Management of University;
4. The Regulation of Minister of Education and Culture No. 46 the Year 2014 about Special Education, Special Service Education and or Special Service Learning at University;
5. The Regulation of Minister of Research, Technology, and Higher Education No.44 the Year 2015 about The National Standard of Higher Education;
6. The Regulation of Minister of Research, Technology, and Higher Education No.75 the Year 2016 about Public Information Service at Ministry of Research, Technology, and Higher Education;
7. The Regulation of Minister of Education and Culture No. 6 the Year 2020 about Recruitment of New Student in Bachelor Degree Programme at State University (Republic of Indonesia News Year 2020 No. 50).

UNJ students can be accepted from several tracks:

1. SNMPTN (https://penmaba.unj.ac.id/snmptn/),
2. SBMPTN (https://penmaba.unj.ac.id/sbmptn/),
3. Independent Writing Exam (Mandiri Ujian Tulis: https://penmaba.unj.ac.id/mandiri-ujian-tulis/),
4. Independent Achievement (Mandiri Prestasi: https://penmaba.unj.ac.id/mandiri-prestasi/),
5. Postgraduate (Pascasarjana: https://penmaba.unj.ac.id/mandiri-pascasarjana/),
6. Past Learning Recognition (Rekognisi Pembelajaran Lampau/RPL)
7. Student's Transfer (https://penmaba.unj.ac.id/mahasiswa-pindahan/).

The entrance track and selection are informed in the webpage https://penmaba.unj.ac.id/

Since 2019, Collective Selection of State University Entrance (SBMPTN) has been utilizing the Computer-Based Writing Exam (UTBK) and other criteria that the state university decides. UTBK is an entrance test to the university that LTMPT holds. The implementation of UTBK by LTMPT is excellent because its test results are credibly standardized, and the

student gives the score individually. LTMPT is the only standardized institution of university test implementation in Indonesia.

UTBK 2021 is open for the students who are graduated in 2019, 2020, and 2021 from High School (SMA/MA/SMK and its level) and the *Paket C* programme with a minimum age of 25 years old. Participating in UTBK is the main requirement to follow Collective Selection of University Entrance at state universities (PTN and PTKIN) and state polytechnics (Politeknik Negeri). UTBK and SBMPTN aim to predict the student candidates who can complete their study programme at university very well and in time; and give a chance for the student candidates to choose state university or state polytechnics across the regions; as well as to help the state university to recruit the student candidates who are expected to complete their study programme based in the academic score and or other achievements.

The admission requirements of the Chemistry study programme, Chemistry Education study programme, Biology study programme, and Biology Education study programme utilize the SBMPTN, SNMPTN, and Independent Test Selection (MANDIRI). The percentage of students accepted through the SNMPTN pathway is 30%, the SBMPTN is 40%, and the independent test selection (MANDIRI) pathway is 30%.

Data of participants who take the selection test accepted students and re-register as prospective new students in the Study Programme through three admission paths: Chemistry study programme, Chemistry Education study programme, Biology study programme, and Biology Education study programme presented in Figure 1.15.

Figure 1. 15 Number of Participants, accepted and registered students in 2017-2021 for bachelor's degree in (a) Chemistry Study Programme, (b) Biology Study Programme, (c) Chemistry Education Study Programme, (d) Biology Education Study Programme

The admission requirements of the Master of Chemistry Education study programme and Master of Biology Education study programme are completed by conducting an independent selection test (MANDIRI) from the postgraduate programme. The admission percentage of the Master of Chemistry Education study programme and Master of Biology Education study programme are presented in Figure 1.16

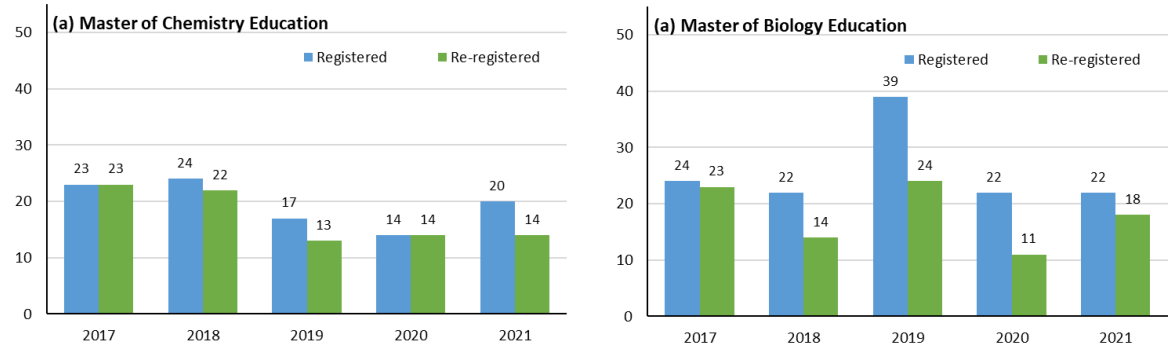

Figure 1. 16 Number of registered and accepted students in 2016-2020 for Master's degree in (a) Chemistry Education Study Programme, and (b) Biology Education Study Programme 2017-2021

The tuition fees for the undergraduate programme are determined by rector decree No. 274/UN39/TM.01/03/2021 considers aspects of a student's economic status on parent's income or salary, housing ownership, electricity bills, and vehicle ownership. The tuition fee is divided into eight levels with a range of 500.000 to 10.000.000 IDR (35 to 700 EUR) per semester. The rector decree of tuition fee levels is attached in (Appendix 1.3).

Meanwhile, for the master's degree Programme, the tuition fee is determined by Rector decree No 968/UN39/KU.00/01/2020 (Appendix 1.4). The first semester's tuition fee until semester IV is 10.000.000 IDR (700 EUR), and after semester IV, the tuition fee is 4.600.000 IDR (320 EUR).

CRITERIA 2: THE DEGREE PROGRAMME: STRUCTURES, METHODS AND IMPLEMENTATION

2.1 Structure And Modules

The structure and modularity of the programme are presented in the bachelor and master programme curriculum through the structure of courses (modules).

2.1.1 Structure and Module of bachelor's degree

The curriculum structure in the bachelor degree programme refers to President Decree 12/2012 on Higher Education and Government Regulation on Standards of higher education regulation (Permenristekdikti number 44 of 2015 and Permendikbud Number 3 of 2020). In addition, to follow the Indonesian National Qualifications Framework, the National Higher Education Standards, the profession's standards in Biology and Chemistry is from the Indonesian Chemistry and Biology Consortium by considering the orientation of future challenges and international accreditation. The courses must be completed during a minimum study period of 8 (eight) semesters and a maximum of 14 (fourteen) semesters with a minimum of 144 credits or 216 ECTS. In the final year, students conduct research and write a thesis.

As presented in criteria one, the curriculum structure of the Chemistry and Biology study programme consists of three groups of courses, namely

a. University Courses are National and General Courses for all students at Universitas Negeri Jakarta
b. Faculty Courses feature specific courses for the Faculty of Mathematics and Natural Science
c. Study Programme Courses consist of Compulsory and Elective Courses. Those courses focus on the specific knowledge and competencies of each study programme.

Chemistry and Biology education focuses on integrating the content knowledge of Chemistry/Biology with pedagogy. Besides those three groups for Chemistry Education and Biology Education, one other group, namely pedagogical courses. Students have experience in fieldwork in school as pre-service teachers. In the final year, students conduct research and write a thesis.

The curriculum structure is based on course classification to achieve Programme Learning Outcome (PLO). The course descriptions can be seen from the modules; the course structure has its Course Learning Outcomes (CLO) to achieve PLO. Students have the opportunity to take compulsory and elective courses and the new policy of freedom of learning called *Merdeka Belajar Kampus Merdeka* (MBKM). MBKM programme provides opportunities for students to take a minimum of 20 credits outside the study programme and university in the forms of students exchange, independent projects, research, teaching assistant, humanitarian activities, entrepreneurship, industrial internship, the project in the village. The new policy provides the student's flexibility in their programme, which enriches the PLO. Programme Learning Outcome (PLO) and all study programme course descriptions (module handbooks) are available on the study programme websites.

2.1.1.1 Structure and Module of Chemistry Study Programme

In the Chemistry study programme, students must complete a minimum of 144 credit hours in courses provided by the university, faculty, study programme, and MBKM. The chemistry study programme courses consist of compulsory courses of 105 credit hours that give general and basic competency for a chemistry bachelor's degree. The elective courses offered to the students consist of 4 credit hours and 20 credit hours of MBKM, and 14 credit hours of general courses. Elective courses are categorized into four interest groups: Bioscience, Inorganic Chemistry, Physical Chemistry, and Analytical Chemistry. In the Chemistry study programme, the curriculum structure has been divided into four years. First-year focuses on basic knowledge of mathematics and natural science, consisting of university courses of 42 credits courses. The second year of study focuses on chemistry-specific competencies consisting of 42 credits courses. Third-year focuses on chemistry and specific competencies in chemistry for 39 credits. Last year consisted of 24 credits to be passed by students who focus on thesis and elective courses that support the thesis. Each course contributes to PLO in the chemistry study programme, like a diagram in figure 2.1.

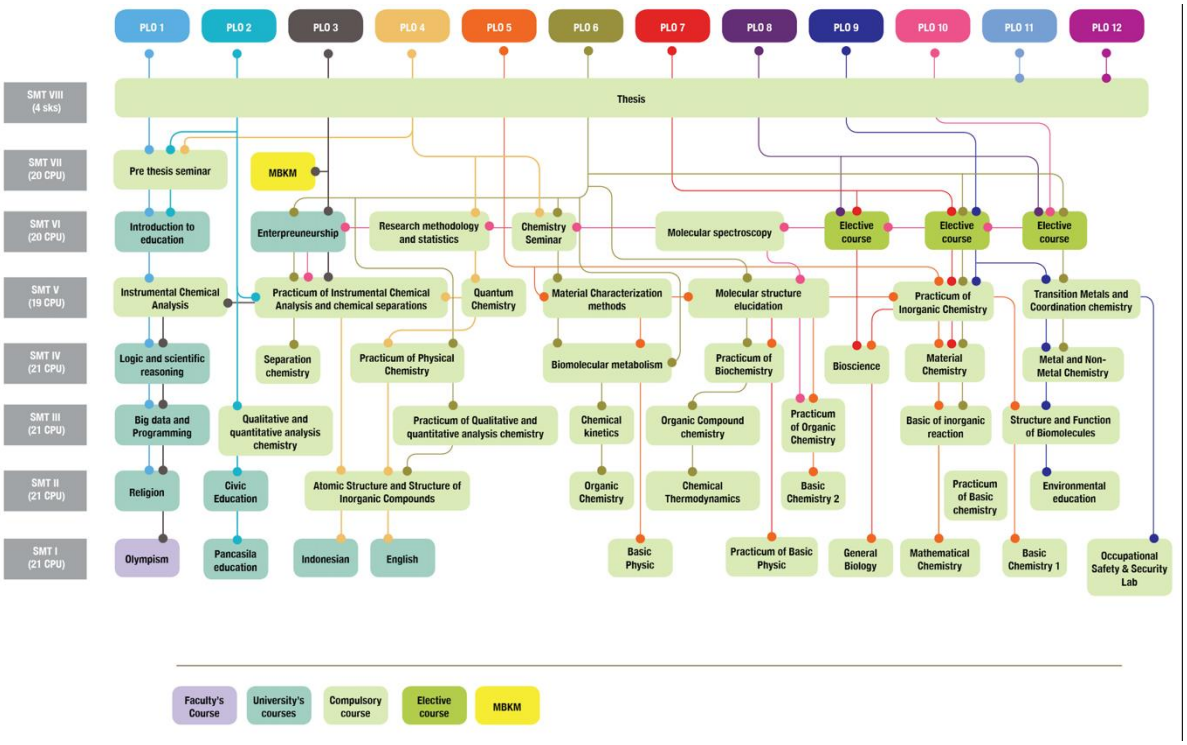

Figure 2. 1 Course mapping based on Courses and PLO in Chemistry Study Programme

Programme Learning Outcome (PLO) and all courses descriptions (module handbooks) from the Chemistry study programme are available on the website (https://fmipa.unj.ac.id/kimia/).

2.1.1.2 Structure and Module of Biology Study Programme

The structure and course (module) in the Biology study programme minimum 144 credits. The study programme course consists of compulsory courses of 92 credit hours that give general and basic competency for a Biology bachelor's degree. The elective courses offered to the students consist of 17 credit hours and 20 credit hours of MBKM, and 14 credit

hours of general courses. Elective courses are categorized into four (4) interest groups: plant science, animal science, ecology, and multidiscipline. In the Biology study programme, the curriculum structure has been divided into four years programme intentions. The **first year of study focuses on basic mathematics and natural science knowledg**e, consisting of consisting of 40 credits courses. **The second year of study focuses on statistics, biodiversity, and biosystematics of plant, animal, and microbes, consisting** of 42 credits courses. The **third** study focuses on animal and plant physiology, molecular biology and research design for 42 credits. **The last** year of study consists of 20 credits to be passed by students who focus on thesis and elective courses supporting the thesis. Each course contributes to PLO in Biology study programme as Figure 2.2.

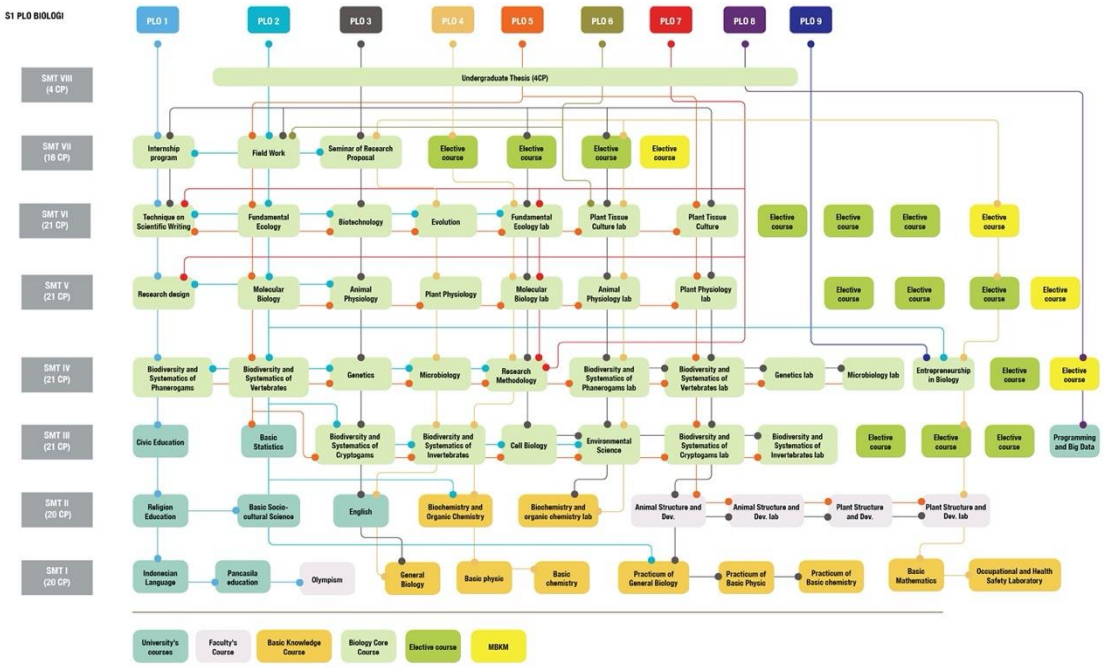

Figure 2. 2 Course mapping based on Courses and PLO in Biology Study Programme

Programme Learning Outcome (PLO) and all courses' descriptions (module handbooks) from the Biology study programme are available on the website (https://fmipa.unj.ac.id/biologi/).

2.1.1.3 Structure and Module of Chemistry Education Study Programme

The structure and course (module) in the Chemistry Education study programme consists of 145 credit hours. The study programme course consists of compulsory courses of 99 credit hours giving general and basic competency for a chemistry bachelor's degree and seven credit hours for general pedagogy courses. The elective courses offered to the students consist of 4 credit hours and 20 credit hours of MBKM, and 14 credit hours of general courses. Elective courses are categorized into five interest groups: Bioscience, Inorganic Chemistry, Physical Chemistry, Analytical Chemistry, and Pedagogy in Chemistry. The curriculum structure in the Chemistry Education study programme has been divided into four years programme intentions. The first-year study focuses on basic knowledge of mathematics and natural science, general course, and basic philosophy of education, consisting of 40 credits courses. The second year of study focuses on pedagogy courses, chemistry, and 39 credits courses. The Third-year of study focuses on chemistry and pedagogy of chemistry for 42 credits. The last year of the study consisted of 24 credits to be passed by students, which

focus on the MBKM programme, thesis and elective courses that support the thesis. The structure in the chemistry education study programme is based on the regulation at the national and university level, which combines chemistry content knowledge and pedagogy. Each course contributes to PLO in the Chemistry Education study programme, as shown in Figure 2.3. Each course contributes to PLO in the Chemistry Education study programme, as shown in Figure 2.3.

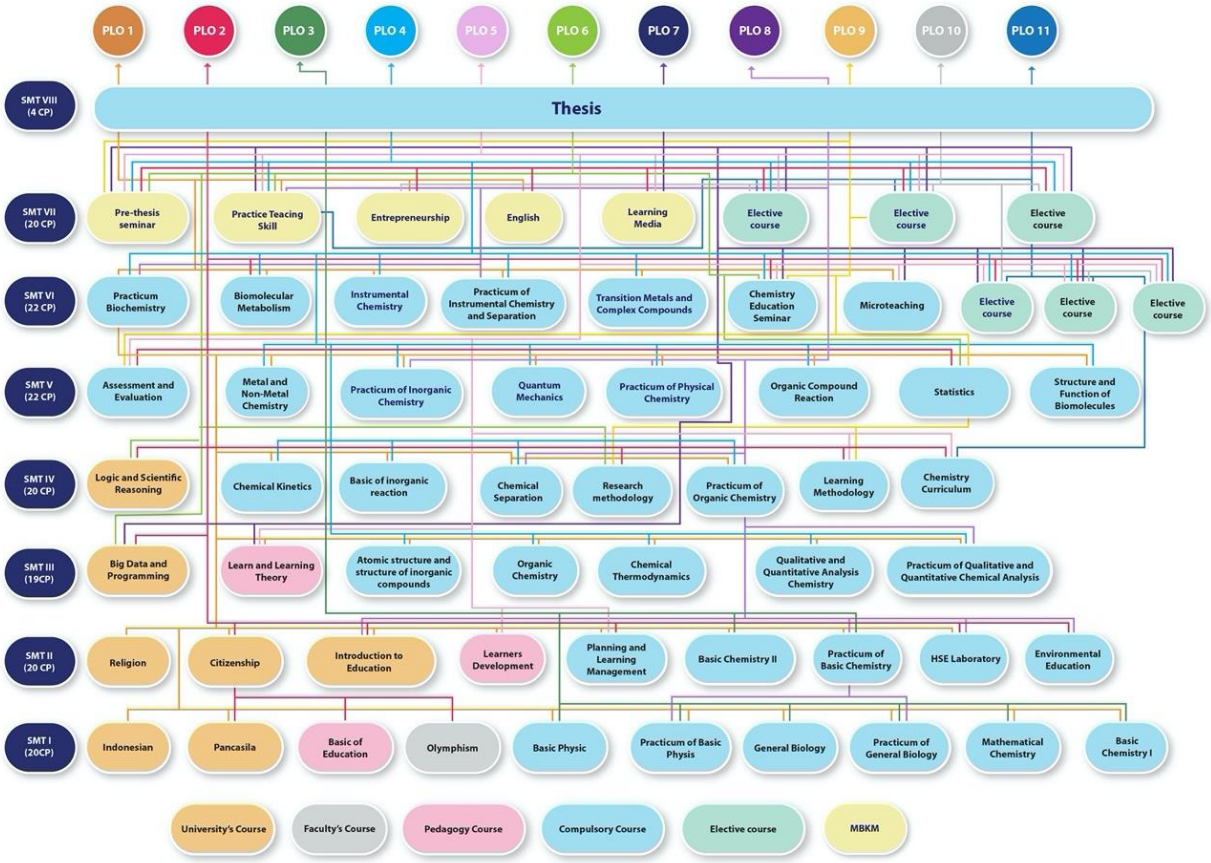

Figure 2. 3 Course mapping based on Courses and PLO in Chemistry Education Programme

Programme Learning Outcome (PLO) and all courses descriptions (module handbooks) from the Chemistry Education study programme are available on the website: (https://fmipa.unj.ac.id/pkimia/).

2.1.1.4 Structure and Module of Biology Education Study Programme

The structure and course module in the Biology Education study programme minimum of 144 credit hours. The compulsory courses of 94 credit hours give general and basic competency for a chemistry bachelor's degree and seven credit hours for general pedagogy courses. The elective courses offered to the students consist of 4 credits hours and 20 credit hours of MBKM, and 14 credit hours of general courses. Elective courses are categorized into two interest groups: biology and Pedagogy in Biology. The curriculum structure has been divided into four years programme intentions in the Biology Education study programme. The first-year study focuses on basic knowledge of mathematics and natural science, general courses, and basic philosophy of education, consisting of of 42 credits courses. The second

year of study focuses on pedagogy courses, Biology, and pedagogy of Biology, consisting of 42 credits courses. The third-year study focuses on Biology and Pedagogy of Biology for 39 credits. The Last year of study consists of 24 credits to be passed by students, which focus on thesis and elective courses that support the thesis. Each course contributes to PLO in Biology Education. Each course contributes to PLO in Biology Education study programme as Figure 2.4.

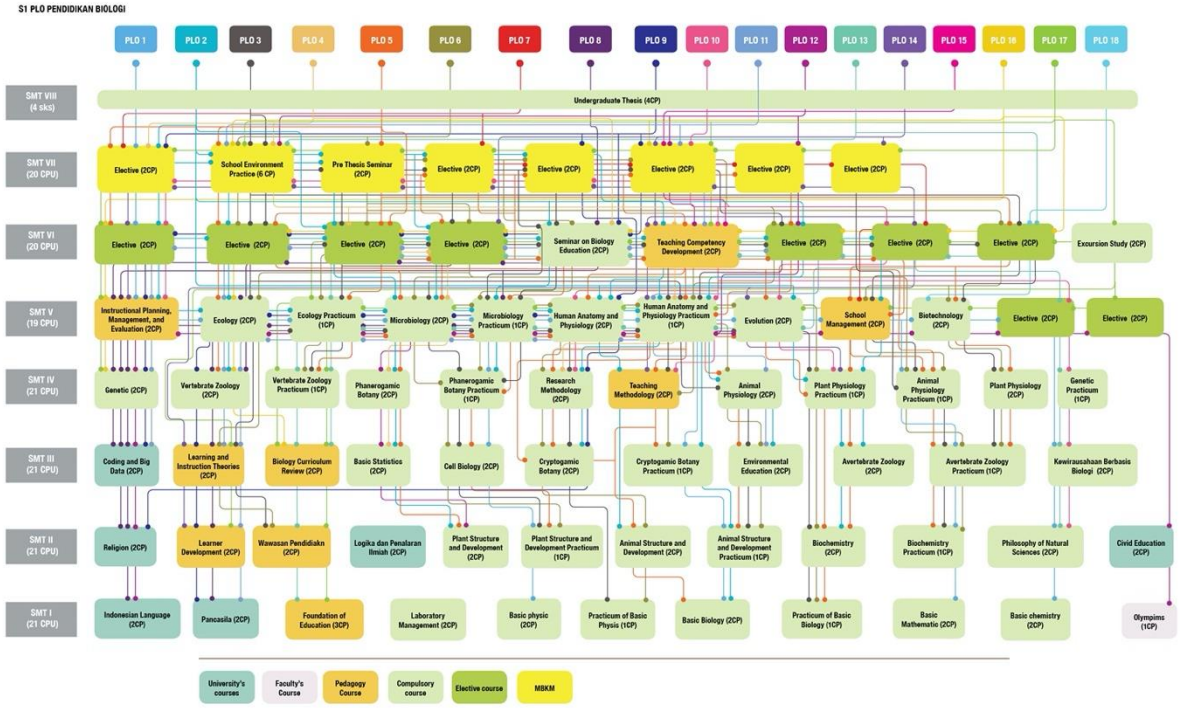

Figure 2. 4 Course mapping based on Courses and PLO in Biology Education Study Programme

Programme Learning Outcome (PLO) and all courses descriptions (module handbooks) from the Biology Education study programme are available: (https://fmipa.unj.ac.id/pbiologi/).

2.1.2 Structure and Module of Master's Degree

The curriculum structure in the master degree programme refers similarly to bachelor degree, which refers to President Decree 12/2012 on Higher Education and Government Regulation on Standards of higher education regulation (Permenristekdikti number 44 of 2015 Permendikbud Number 3 of 2020). In addition to following the Indonesian National Qualifications Framework, the National Higher Education Standards, the Indonesian Chemistry and Biology Consortium standards by considering the orientation of future challenges and international accreditation. As presented in criteria, one the curriculum structure the Master programme consists of two groups of courses, namely

a. University Course which are General Courses (Mata Kuliah Umum-MKU)
b. Study Programme Courses features consist of Compulsory Courses and Elective Courses.

The courses must be completed during a minimum study period of 4 (four) semesters and a maximum of 8 (eight) semesters with a minimum credit of 44 SKS or 114 ECTS. Students conduct research as a final thesis related to their field in the final year. In completing the study, students must publish their research at an international conference and publish their paper in a reputable International Proceeding/Journal.

2.1.2.1 Structure and Module of Master's Degree in Chemistry Education Study Programme

The structure and course (module) in the Chemistry Education study programme consists of 47 credit hours. The compulsory courses of 36 credit hours give general and basic competency for a chemistry master degree. The elective courses offered to the students consist of 2 credit hours elective courses and nine credit hours of general courses. Elective courses are categorized into Chemistry content and publication. In the Master degree of Chemistry Education study programme, the curriculum structure has been divided into two years. First-year focuses on general courses and chemistry pedagogy, consisting of 36 credits courses. The second year of study focuses on chemistry content and pedagogy with a thesis consisting of 18 credits courses. Each course contributes to PLO in Master degree of Chemistry Education study. Each course contributes to PLO in Master degree of Chemistry Education study as Figure 2.5.

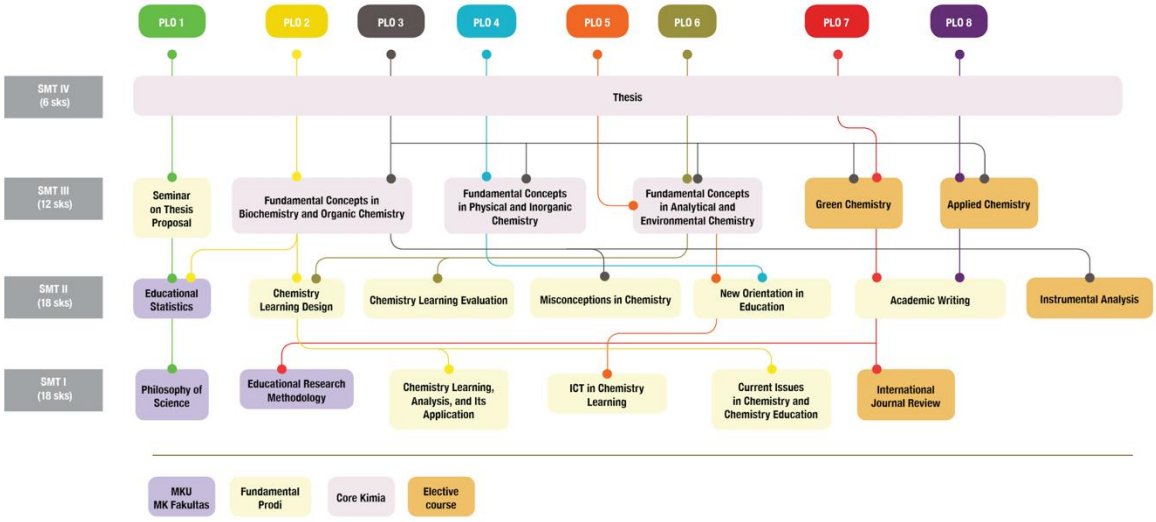

Figure 2. 5 Course mapping based on Courses and PLO in Master's Degree of Chemistry Education Study Programme

Programme Learning Outcome (PLO) and all courses descriptions (module handbooks) from the Master degree of Chemistry Education study programme are available on the website: https://fmipa.unj.ac.id/s2pendkimia/

2.1.2.2 Structure and Module of Master's Degree of Biology Education

The structure and course module in the Biology Education study programme consists of 44 credits with compulsory courses of 29 credit hours, giving general and basic competency for a biology master's degree. The elective courses offered to the students consist of 6 credit hours and nine credit hours of general courses. Elective courses are categorized into Biology content and pedagogy. In the Master degree of Biology Education study programme, the curriculum structure has been divided into two years. First-year focuses on general courses and biology content consisting of 36 credits courses. The second year of study focuses on the pedagogy of Biology, Biology content, and the thesis, which consists of 12 credits courses. Each course contributes to PLO in Master degree of Biology Education study. Each course contributes to PLO in Master degree of Biology Education study as Figure 2.6.

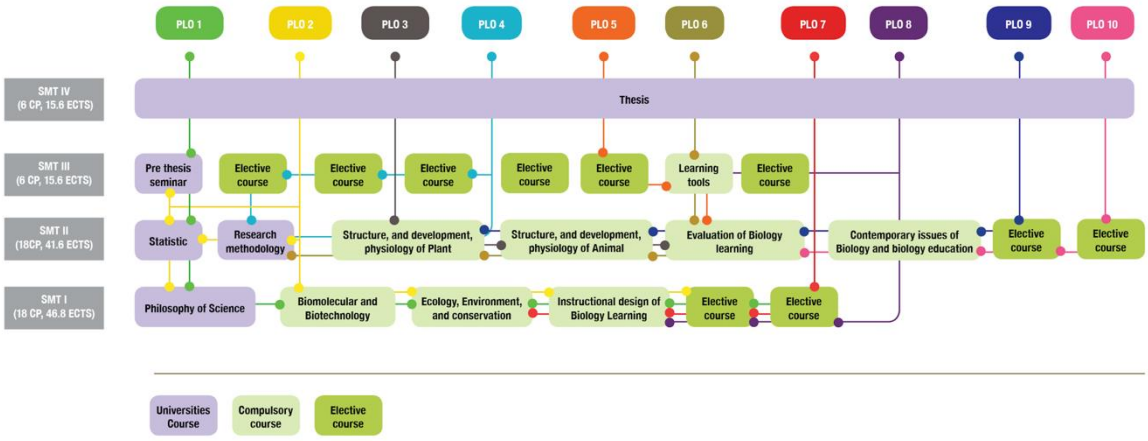

Figure 2. 6 Course mapping based on Courses and PLO in Master Degree of Biology Education Study Programme

Programme Learning Outcome (PLO) and all courses descriptions (module handbooks) from the Master degree of Biology Education study programme are available on the website: https://fmipa.unj.ac.id/s2biologi/

2.2 Workloads and Credits

Courses in the academic curriculum are designed based on Programme Learning Outcome (PLO). According to the National Standard of Higher Education, the determinants of the approximate scale of the credits are:

1. the expected level of competence (Graduate Competency Standards for each type of programme)
2. the depth and breadth of course materials that must be mastered (Standard Content of Lessons)
3. the learning method/strategy chosen to achieve the competence (Learning Process Standard).

The Course Credits are the amount of time for learning activities charged to students per week per semester in the learning process through various forms of learning or the amount of recognition for the achievement of students' efforts in participating in the curricular activities in a study programme. The course credits for the educational process are determined based on workloads that include three activities per week: face-to-face learning/lecture, structured tasks, and individual learning. For structured and individual learning, lecturers must ensure the workload is relevant to the time given. To ensure students and lecturer activities in the teaching process, there is a form of learning activities to be completed by lecturers and students, consisting of presences of lecturers and students for 16 weeks, including the topics and record activities. Student workload analysis is attached in Appendix 2.1.

In assessment tasks, lecturers have the flexibility to determine the proportion of assignment, mid-semester, and final semester scores—the determination has based on the analysis of subject matter course and type of assignments and tests. For example, in chemistry curricula courses, the score proportion of assignments is 30%, the mid-semester is 30%, and the final semester is 40%. Other courses can be assigned 20%, the mid-semester is 35%, and the final semester is 45%.

To obtain a bachelor and master's degree, students must write a thesis as a final project. The choice of research topics can be quantitative or qualitative research discussed with the

supervisor. Students must communicate their research proposal and research results (thesis) scientifically through seminars. The examiner is required to assess the thesis during the seminar. The examiner and supervisor for the thesis must have at least a master's degree for bachelor and doctoral degrees for master thesis. The seminar includes a written thesis, seminar presentation, and discussion where students must defend their work before the examiners. The exam must be taken at least two weeks before the plan. Research proposals and theses are worth 6 (six) credit points. The final exam is evaluated by two examiners of the bachelor's thesis approved by the study programme coordinator. The assessment of the final thesis depends on each study programme but is similar primarily in terms of research quality, thesis writing, and publication (only for master degree). For example, in Biology study programme as follow:

1. Research Quality (20%)
    a. The strategic and the problem to be solved in the research
    b. Formulation of the problem
    c. Research objective
    d. Coherency of Research Flow
    e. Output (Process & Product)
2. Research Methodology (20%)
3. Result and Discussion (20%)
4. Thesis Structure and Writing (20)
5. How to defend the thesis in the Final Exam (20%)

Furthermore, to develop their knowledge, students can carry out extracurricular activities and achieve achievements outside of their educational process, and they will be given specific scores. Diploma supplement consists of Diploma supplements consist of a graduate certificate, score transcripts and certificate accompanying diploma (SKPI-Surat Keterangan Pendamping Ijazah). SKPI is an assessment to acknowledge the achievement of students' extracurricular and curricular activities. A diploma supplement is one of the optional prerequisites to graduate. Activities outside the educational process include student participation in the student orientation, reasoning and scientific activities (for example: attending seminars or workshops, achievements in the National Student Creativity Programme, the National Chemistry Olympiad), organizational activities and leadership, community service activities, and other. The guidance of extracurricular activities scoring is based on the guidance from the university.

In addition to the Freedom of learning policy (MBKM), students can take courses and activities both academic and non-academic at local, national, and international levels. The recognition of credits is determined by the ministry, university and study programme. Ministry provides general guidelines, including the type of activities and credits. University follows the regulations and determines the conversation of courses and credits hours. It is followed by a study programme, especially for specific courses and activities.

2.2.1 Workload and Credits of Bachelor Degree

One course credit (SKS) of the Bachelor and Master programme is determined based on the regulation from government law (Permenristekdikti number 44 of 2015 and Permendikbud Number 3 of 2020) and University Decree (Rector Decree: 1435/UN39/HK.02/2021). One credit hour of bachelor's degree is divided into lectures (50 minutes/week), structured tasks (60 minutes/week), and independent tasks (60 minutes/week). In other words, one credit is equivalent to 170 minutes or 2.83 hours of work. The length of one semester is 16 weeks; therefore, the total hours is 45.33 hours. The total hours. Meanwhile, in ECTS, the course hour is conducted for ten meetings with 3 hours for each meeting, so that it equals 30 hours. Therefore one credit equals 1.5 ECTS (45.33 hours

is divided into 30 hours).

Table 2. 1 Definition of one credit of Bachelor Degree

Definition of 1 credit in the form of learning			
a	Lecture, Response, Tutorial		
	Lecture	Structured task	Individual learning
	= 50 Minutes/week/semester = 0,83 hours x 16 weeks = 13,33 hours	= 60 Minutes/week/semester = 1 hour x 16 weeks = 16 hours	= 60 Minutes/week/semester = 1 hour x 16 weeks = 16 hours
Total: 45,33 hours= 1,5 ECTS			
b	Seminars or similar forms of learning		
	Seminar	Individual learning	
	= 100 Minutes/week/semester = 1,67 hours x 16 weeks = 26,72 hours	= 60 Minutes/week/semester = 1 hour x 16 weeks = 16 hours	
Total: 42,72 hours= 1,4 ECTS			
c	Laboratory practices, internship, research, student exchange, entrepreneurship, community services, or similar forms of learning		
	= 170 Minutes/week/semester = 2,83 hours x 16 weeks = 45,28		
Total: 45,28 hours= 1,5 ECTS			

The head of the department has delegated an academic advisor to guide student learning plans. The students' study loads per semester are determined by considering individual competencies, interests and talents. This was observed from student studies or the previous semester's achievement index (GPA). GPA per semester will be given at the end of the semester, and the cumulative GPA will be determined based on all semester GPAs. Based on the previous semester's social studies, students can consider the maximum workload for the next semester based on their competencies. A student's study plan for each semester should have the approval of an academic advisor. The expected learning load of the student is 18-20 credits per semester. Meanwhile, students' study loads with a GPA higher than 3.5 after one semester can be added up to 24 credits per semester (BPA). Credits and student's load for the following semesters are determined by the GPA of the previous semester.

Table 2. 2 Maximum Limit of Student Study Loads, Correspond to GPA

Semester GPA	**Maximum Credit for the following semester (Credits)**
2.00 – 2.74	20 credits
2.75 – 3.29	22 credits
≥3.30	24 credits

This range is determined in the students' academic guidebook, which is determined by Rector Decree No. 13/2020.

2.2.2 Workloads and Credits of Master's Degree Students

One credit hour of students' workload in master's degree is divided into lectures (50 minutes/week), structured tasks and independent tasks (240 minutes/week). In other words, one credit is equivalent to 290 minutes or 4.83 hours of work. The length of one semester is 16 weeks; therefore, the total hours is 77.33 hours. Meanwhile, in ECTS, the course hour is conducted for ten meetings with 3 hours for each meeting, so that it equals 30 hours. Therefore

one credit equals 2.6 ECTS (77.33 hours is divided into 30 hours). The description of one credit can be seen Table 2.3 below.

Table 2. 3 Definition of one credit of Master Degree

Definition of 1 credit in the form of learning		
a	Lecture, Response, Tutorial	
	Lecture	Structured task and Individual learning
	= 50 Minutes/week/semester = 0,83 hours x 16 weeks = 13,33 hours	= 240 Minutes/week/semester = 4 hours x 16 weeks = 64 hours
Total: 77,33 hours= 2,6 ECTS		
b	Seminars or similar forms of learning	
	Seminar	Individual learning
	= 100 Minutes/week/semester = 1,67 hours x 16 weeks = 26,72 hours	= 60 Minutes/week/semester = 1 hour x 16 weeks = 16 hours
Total: 42,72 hours= 1,4 ECTS		
c	Laboratory practices, internship, research, student exchange, entrepreneurship, community services, or similar forms of learning	
	= 170 Minutes/week/semester = 2,83 hours x 16 weeks = 45,28	
Total: 45,28 hours= 1,5 ECTS		

The Completed Master Programme should earn around 44 credit semester or 114.4 ECTS**.**

2.3. Teaching Methodology

Teaching and learning consist of compulsory curricula activities through various courses with measurable workloads (Appendix 2.2). The course has Course Learning Outcomes (CLO), which consists of specific abilities to fulfil the Programme Learning Outcome (PLO). One course can contribute to more than one PLO. One course can employ different teaching methodologies to achieve CLO. According to Higher Education Law (Permendikbud No.3/2020), teaching methodologies in higher education are discussion group, simulation, case study/case-based learning, collaborative learning, cooperative learning, project-based learning, problem-based learning, or other teaching methodologies. As per the Freedom of Learning (MBKM) policy, students can engage in different forms of learning, including studying, tutorials, seminars, practicum, research, workshop, student exchange, apprenticeship, entrepreneur, and community services.

Examples of several types of courses related to teaching methodology are Table 2.4 below:

Table 2. 4 Several Types of Teaching Methodologies

No	Types of Activities	Teaching Methodology	Example of Courses
1	Lecture	Lecturing, discussion, collaborative and cooperative learning, problem-based learning, project-based learning, case-based learning	Basic Chemistry, Inorganic Chemistry, General Biology, Basic Ecology, teaching methodology, assessment, and others

2	Practicum	Project-based learning	Basic Chemistry, Biology Practicum, etc.
3	Fieldwork	Project-based learning	Zoology and Botany, etc

Teaching instruments and teaching methods are designed and implemented to support the achievement of Learning Outcomes (LO) and are written in the study plan. Instruments to be used include printed media, electronic media, e-learning, Model. Learning methods to be applied is a combination of Teaching Centered Learning (TCL, e.g., class teaching, demonstration, and practices), Student-Centered Learning (SCL, e.g., group discussion, problem-based learning), and Research Methodology (i.e., students are trained to search kinds of literature, find research ideas, write proposals, research reports, and papers, and give presentations).

The teaching methodologies employed student centre learning (SCL), allowing students to use knowledge and understanding to solve authentic problems. It involves students' interests and motivations, links theoretical concepts learned in the classroom and explores their applications. Cooperative learning (CL) guides students to use knowledge and understanding to solve problems by working in small group activities to accomplish learning goals. Case-based learning (CBL) directs students to engage in a discussion by using specific scenarios given. This is an excellent method to improve critical thinking and problem skills through real-world examples. Students also learn by exploring and investigating in-depth projects through project-based learning (PjBL). PjBL provides opportunities to help students develop critical thinking, cooperation, creativity, and communication skills. The projects can be done independently or in groups over a period–from a week up to a semester. Results achieved are demonstrated by creating public products or presentations. Project-based learning can extend students' understanding and enhance interaction in completing authentic problem-based assignments that occur in everyday life. Learning media used include learning laboratories, journals, laptops, schools, etc. Skill-based learning uses a laboratory where independence, thinking skills, collaboration and active learning are developed simultaneously as knowledge is obtained.

The instructional language mainly uses Bahasa, but several courses use English, such as English courses and other study programme courses. However, lecturers use teaching and learning resources in English. Students can join international guest lecturers and student mobility to enrich their English skills.

The lecturers can apply the learning instruments and methods according to their teaching subjects. The lecturers' semester lecture plans help ensure a learning process that is interactive, holistic, integrative, scientific, contextual, practical, collaborative, and student-centred. Roles of lecturers in the teaching-learning process include: designing and redesigning curriculum, arranging teaching team, designing learning contract, study plan and assessments, and learning process. The teaching team consists of lecturers with similar expertise. Moreover, the teaching team conducts its achievement evaluation through exams (mid-exam, final exam, Quiz, and assignments). The Quality Assurance Unit monitors the learning process and achievement of ELO/LO at the Faculty Level (GPjM). Relevant training is provided to ensure that lecturers are competent in applying didactical methods and using the instruments to increase the achievement of intended LO. The lecturer performance index in the teaching-learning process can indicate whether the academic staff has implemented the didactical method and made the most out of the instrument. Moreover, the study programme provides facilities that support the academic atmosphere, such as rooms and spaces for academic and non-academic activities, internet access in an open area, and reading rooms with access to online literature.

2.4. Support and Assistance Advice

The head of the department supports the success of student studies by delegating academic advisors from the teaching staff team. Academic advisors provide academic guidance to students with a meeting before the semester begins. Students must have reasonable access to meet the teaching staff to facilitate an adequate office. The faculty also instructs all teaching staff to be present regularly and observe attendance with a fingerprint machine. There is also a class attendance report in which the lecturer attendance in class is recorded.

Table 2. 5 List of Personnel and Units

Position	Task Description
Head of Department	They are person-in-charge to evaluate and develop in study guidance.
Thesis Advisor	Guide students to choose a research topic based on the student's interest and guide students in writing the final project.
Academic Advisor	Guide students to prepare their study plans in selecting compulsory and elective courses from career guidance and watch their academic development.
Lecturer	The lecturers facilitate the learning process that has been previously scheduled following the assignments assigned before the semester begins.
Laboratory Staff	Staff assist the students in experimental laboratory work and maintain the laboratory equipment.
Student Assistant	Student assistants are students who help in a laboratory during the practical work.

In laboratory work, besides the lecturers, there are laboratory staff and student assistants who assist students in conducting practicum. There are a minimum of three assistants in one practicum and two laboratory staff. The book of academic consultation is attached in Appendix 2.3. The thesis guideline and process supervision are attached in Appendix 2.4.

Every student will have 2 (two) thesis supervisors, specialists from related divisions, who give complete guidance in carrying out proposition, beginning from finding inquire about thought, composing proposition, conducting research, writing the report, and planning distribution articles. Interviews are carried out at the slightest six times per semester and are recorded within the meeting card. Understudies have rights to utilize offices available in the staff and investigate centres at the college and are helped to organize inquire about allow. Thesis supervisors are moreover accessible to help understudy conducting investigate for their proposal.

Students also get several facilities and services at the university for lecture activities and a students' club that aims to support personal development, as described in the following Table 2.6.. The information of students' activities in curricular and extracuricullar, including in Pandemic situation is attached in Students' Supplement (Appendix 2.5)

Table 2. 6 Facilities and Services

Facilities and Services	Description
Laboratory	Facilities for developing students skills in body knowledge and research
Information, Communication, and Technology (Pustikom)	Provides internet connection services in the campus area, provides Academic Information System (SIAKAD), New Student Admission Information System (SIPENMABA), and Single Tuition Fee System (SIUKAT). (pustikom.unj.ac.id)
Language Center of UNJ (LCU)	Language service centre serves the needs of the UNJ academic community and the general public. (languagecenter.unj.ac.id)
Library	Center for information, education, research, and recreation. (http://lib.unj.ac.id)
Guidance and Counseling (LBK-Karir)	An institution that functions to develop the potential of UNJ graduates who are in preparation for entering the world of work. (http://upt-lbk.unj.ac.id)
Clinic	Basic health facilities, providing general poly and dental clinics
Mosque	Facilities for praying and developing students' spiritual competences
Internet Access	Students have internet access with a speed of internet access

Table 2. 7 Students' Club

Organization	Description
Student Activity Units	
Student Arts Unit (UKM)	Facilitate students' appreciation of art and develop their talents and arts.
Student Research Institute (LKM)	Forum that aims to develop students' critical and dynamic scientific insight and reasoning. (www.lkmunj.org)
Student Sports Unit (UKO)	Fostering and developing the potential of UNJ students in organizing and exercising. UKO has contributed a lot to

Organization	Description
	the achievements that bring the fragrance of UNJ.
Racana Scouts	Organization in scouting at the university level with the Pandega level.
Eka Citra Nature Lovers	A student organization that is engaged in the field of nature
KSR Indonesian Red Cross	Student organization engaged in the humanitarian, social, and health fields under the auspices of PMI. (ksrpmiunitunj.org)
Photography (KMPF)	Forum for student organizations engaged in the field of photography.
Child Lovers Social Group (KSPA)	Organization in the social field that organizes mobile kindergarten for underprivileged children and KSPA is a gathering place for students who love the world of children's education.
Student Regiment (Menwa)	Realizing the spirit of Patriotism and Nationalism in the framework of Defending the Republic of Indonesia
Educational Radio Broadcasting Agency (ERAFM-UNJ)	Education-based community radio on campus, often known as campus radio, is a forum for information for the campus community and surrounding environment. (www.erafm-unj.com)
Student Cinematography and Television (Sigma TV UNJ)	Student organization engaged in Audio Visual, Television Journalism, and Cinematography, a forum for UNJ students to develop talents in film and broadcasting. (www.sigmatvunj.org)
Student Research Institute Didaktika UNJ	The student body develops critical talents in journalism and builds critical thinking. (didaktikaunj.com)
Student Union (KOPMA)	Building student creativity, developing business talent and functioning as a cooperative in general.
Young Researcher Group (KPM)	Student activity units at UNJ which is engaged in research and reasoning. (www.kpmunj.org)

Organization	Description
Campus Da'wah Institute (LDK Salim)	Student activity units in charge of Islamic spirituality within the Jakarta State University. (salimunj.org)
Christian Student Fellowship (PMK)	A spiritual forum for UNJ students who are Christian.
Hindu Buddhist Student Group (KMHB)	A spiritual place for students who are Hindu and Buddhist.
Student Government Organization (OPMAWA)	
UNJ Student High Council (MTM UNJ)	University-level student legislature.
UNJ Student Executive Board (BEM UNJ)	University-level student executive body.
Faculty Student Executive Board (BEMF)	Faculty-level student executive institution located in each faculty.
Faculty Student Representative Body (BPMF)	Faculty-level student legislature located in each faculty.
Study Programme Student Executive Board (BEMP) / Study Programme Student Association (HIMAP)	Executive institution for students at the study programme level located in each faculty.
Study Programme Student Legislative Body (BLMP)	Student legislature at the significant level in every study programme has an executive body in the form of a BEMP.

University, Faculty, and study programme also involve students in research, community services, organising seminars and conferences, and other activities. Students are joining academic and nonacademic activities through the students' board. As stated above, students' activities will be stated in SKPI as a diploma supplement.

University provides facilities and a students' board to achieve students' competencies in PLO. University is recognized for a wide range of academic and non-academic achievements at national and international levels. Examples of students' achievement in an undergraduate programme

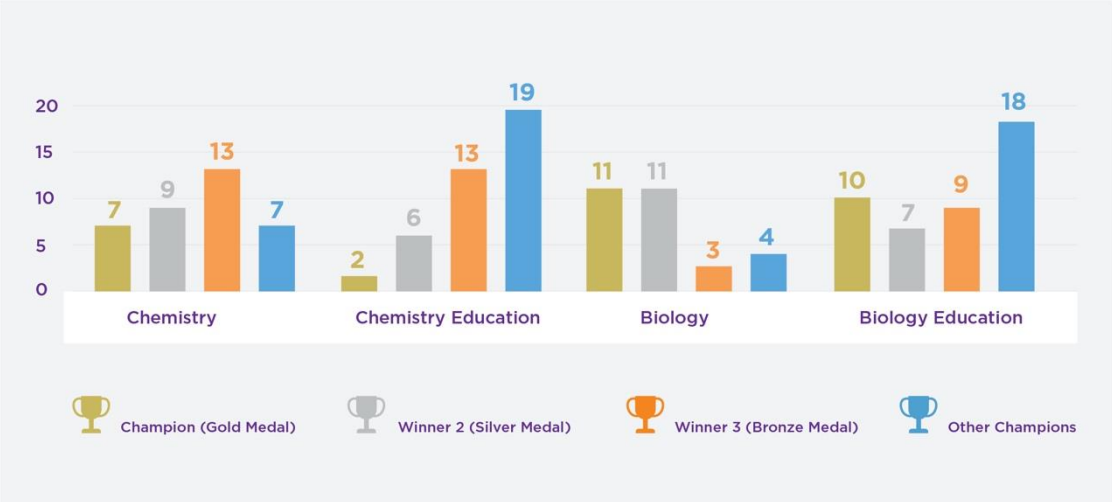

Figure 2. 7 Student Achievements

The study programme provides a different range of supports to achieve

2.5. Alumni

The study programme continuously communicates with alumni through association, surveys, and social media. Graduation of each study programme has job opportunities relevant to graduate profiles such as educators, scientists, researchers, and entrepreneurs, even though other alumni have jobs different from graduate profiles. Alumni of Universitas Negeri Jakarta has an organisation in university, faculty, and study programme.

Alumni plays essential roles in supporting university, faculty, and study programme to achieve vision, mission, and goal. The study programme communicates with Alumni through association through several activities such as Seminars, workshops, Tracer Study, and other activities. The study programme uses social media to communicate with alumni, such as Whatsapp, Instagram, etc. Alumni are also invited to provide feedback regarding the curriculum, activities, etc. Alumni completed the tracer study through questionnaires about working experiences, skills, competencies, relevances of knowledge and skills with a workforce, and other feedback for the study programme. Alumni shares their experiences in workforces for students through seminars and workshops. They also provide social activities such as funding and support during pandemic situations.

2.6. Internationalisation

Universitas Negeri Jakarta collaborates with several countries in Asia, Africa, Europe, and Australia. University has accepted international students from 33 countries who participate in the Southeast Asia Mobility programme in short summer courses, regular programmes funded by dharmasiswa, and post-graduate programmes in collaboration with partner universities such as the Philippines Normal University.

Faculty of Mathematics and Natural Sciences has developed international cooperation with international institutions through guest lecturers, research collaboration, and summer school. Examples of international collaborations from different study programmes as below.

Table 2. 8 Examples Activities of Internationalisation Activities

No	Study Programme	Activities
1	Undergraduate Chemistry	• Guest lecturer by Dr. Mari Takahasi on X-ray Photoelectron (Japan Advanced Institute of Science)
2	Undergraduate Chemistry Education	• Guest lecturer by Prof. Ingo Eilks on Sustainability Chemistry (Bremen University, Germany) • Research collaboration on STEAM in chemistry learning with Prof. Peter C. Taylor (Murdoch University, Australia)
3	Undergraduate Biology	• Guest Lecturer by Junshan Chang, PhD on Virus Based Infection (Taiwan Medical University) • Research collaboration with Prof of College of Pharmacy, Jinan University, Guangzhou, China
4	Undergraduate Biology Education	• Guest Lecturer by A/Prof Tan Aik Ling, PhD on STEM Education (Taiwan Medical University)
5	Master degree in Chemistry Education	• Research collaboration with Prof. Hans-Dieter Barke (Muenster University, Germany) • Guest Lecturer by A/Prof. Rekha Koul on Learning Environment (Curtin University, Australia)
6	Master Degree in Biology Education	• Guest Lecturer by A/Prof Tan Aik Ling, PhD on STEM Education (Taiwan Medical University)

The collaboration of each study programme is attached in Appendix 4.7

Regarding this situation, it can be seen that most international students studying at UNJ are due to a form of cooperation. FMIPA UNJ has accepted international students from 4 countries: Malaysia, Thailand, Japan, and Nigeria. The international students took a short summer course in the Southeast Asia Mobility for Students' 21st Century Skills' Development (SAM21) programme in 2017-2020 and Global Online Collaborative Learning: Problem Based Learning 2.0 (GOCPBL20) programme in 2021. For this reason, FMIPA UNJ needs to expand further by broadening its network of cooperation with foreign educational institutions. In line with the MBKM programme, collaboration with overseas universities, listed as 100 QS ranking universities, could support FMIPA UNJ in opening new study programmes/international classes, support the policy of taking courses outside the study programme, and encourage more international students to study at UNJ, as a fulltime international student of UNJ.

UNJ already has the Office of International Education Affairs (OIEA) or Kantor Urusan Internasional (KUI) to support internationalisation. This unit has been enforced to provide mobility services to the academic community carry out various academic/non-academic activities at the international level. In addition, KUI is also tasked with providing services to overseas students or lecturers who will carry out academic activities at UNJ. The number of international students studying at Jakarta State University from 2017 to 2021 is presented in Table 2.9 below.

Table 2. 9 Foreign Students in FMIPA UNJ

Year	Number of Students
2017	22
2018	22
2019	8
2020	22
2021	22

Based on Table 2.9, the number of international students who took part in the short summer course at FMIPA UNJ in 2017-2021 was 96 students. The students are from Universiti Teknologi Malaysia (UTM); King Mongkut's the University of Technology Thonburi, (KMUTT) Thailand; Ritsumeikan University, Japan; and University of Ibadan, Nigeria. UNJ will continue to improve services and quality in each study programme so that the number of international students studying at FMIPA UNJ increases, especially full-time students.

CRITERIA 3: EXAMS: SYSTEM, CONCEPT AND ORGANISATION

3.1 Assessment System

An assessment provides information about achievement learning outcomes. An assessment provides an overview of a student's progress and evaluates the success of a course learning planned in the module and portfolio of each course. The module describes the courses' Programmes Learning Outcome (PLO) and Course Learning Outcome (CLO), a form of assessment, examination rules, and references list. The relation of PLO and CLO to the course in each study programme is described in the module description (Appendix 3.1) Meanwhile, the portfolio describes learning achievement calculation based on the PLO and CLO set up.

Assessment is made to evaluate student learning processes and outcomes to fulfil graduate learning outcomes. The exam is designed to evaluate student learning processes and outcomes to fulfil programme learning outcomes (PLO). There is a set of standardized assessments in exams to measure it. The example of portfolios and exams are attached in Appendix 3.2. With the implementation of the exam, it can be seen how far students can master the learning material. Based on the rector's decision Number 1189.a/UN39/PK.00/2020 regarding academic manuals, course exams are conducted at least twice in one semester, namely the Mid-Semester Examination and the Final Semester Examination. The exams cover several types, such as quizzes, paper writings, and project report writings. Student activities are based on student attendance and participation when carrying out learning. For example, students actively participate in opinions during discussions in class. Assignments consist of individual assignments and group assignments. However, it is varied among the lecturers based on the characteristics of the courses and their CLO. The study programme coordinator has to arrange the exam schedules. The lecturer has to arrange the exam questions and submit them, and approve them by the coordinator at least one week before the exam.

Table 3. 1 Final Assessment System

Comprehension	Letter Grade	Numerical Grade
86—100 %	A	4
81—85 %	A-	3.7
76—80 %	B+	3.3
71—75 %	B	3
66—70 %	B-	2.7
61—65 %	C+	2.3
56—60 %	C	2
51—55 %	C-	1.7
46—50 %	D	1
< 46 %	E	0

According to Table 3.1 minimum grade to pass each course is C for the bachelor programme and B for the master programme. Students, who do not pass, must repeat in the next semester and re-register in the educational system via the link (http://siakad.unj.ac.id). The course process re-sits the same as other students.

According to the academic guidelines of Universitas Negeri Jakarta, student qualifications are manifested by the lecturer in the form of final grades. The lecturer must conduct research based on educative, authentic, objective, transparent and accountable

values. All students who have completed all courses have the right to evaluate the lecturer. The students who have a make-up exam are those with the following reasons: a) they are sick and should be hospitalized by showing a letter from the hospital; b) they have a mandatory activity from the university of the country; c) they are not able to join the mid-term and final-term exams due to a good background (e.g. suffer from a disaster by showing the letter from any in-charge person). The make-up exam for mid-term and final-term are completed separately after the main schedules of exams. The Table of Final Assessment System is available in Table 3.1.

The academic regulations also manage the exam conditions and deadlines to input the scores in the academic system (http://siakad.unj.ac.id/). For example, the score results during face to face courses are submitted in two weeks. After that, the course evaluations for the lecturers (EDOM-Evaluasi Dosen Oleh Mahasiswa) are completed by the students in two weeks. After the evaluation (EDOM) is completed, the system will automatically give a penalty score if a lecturer has not input the score in the academic system to receive a B grade.

Previously, it is stated that the exam is basically for measuring the PLO achievement of each course; therefore, it is necessary to relate PLO and CLO (Course Learning Outcome) of every course to form an assessment format.

3.2 Assessment Methods

The assessment method is divided into direct and indirect assessments. The direct assessment measures Cognitive (knowledge and understanding), such as Examination, Essay Writing, Course-work Report, Laboratory Report, Oral Examination, Presentation, Project, and Seminar. Meanwhile, the indirect assessment measures Affective and Psychomotor (attitude and ability), such as Focus Group, Practicum, Case Study, and Interview. The assessment forms for every course in Chemistry Bachelor Programme (S1), Chemistry Education Bachelor Programme (S1), Chemistry Education Master Programme (S2), Biology Bachelor Programme (S1), Biology Education Bachelor Programme (S1), and Biology Education Master Programme (S2). The portfolio of courses in the study programme is attached in Appendix 3.2.

Grade Point (GP/IP) is divided into Semester Grade Point (GPS/IPS) and Grade Point Average (GPS/IPK). The semester grade point is counted based on total weights of course score multiplied with total credits of courses in every semester and divided by the total of credits inactive semester as elaborated in the following equation:

$$IPS = \frac{\sum(Weighted\ Score\ x\ credit)\ active\ semester}{\sum credits\ of\ active\ semester}$$

The semester grade point is counted based on the total courses taken in the semester. Meanwhile, the grade point average is counted based on the total weight of passed score courses multiplied by the total of passed course credits and divided by the total of passed course credits.

$$IPK = \frac{\sum(Weigheted\ scores\ x\ credit)\ passed\ course}{\sum credits\ of\ passed\ course}$$

The grade point average is counted by excluding the failed course score. The course scores in the grade point average are the current scores from a course that has been taken more than one time.

Learning supervision is conducted by Quality Assurance of Faculty (GpjM). GpjM is required to supervise the attendance of lecturing activity every three meetings. It also recommends shifting the lecturer if they don't teach twice in a row without permission from the Study Programme coordinator. The lecturer will firstly get a warning from Dean, and then, they will be replaced with another lecturer if they still don't teach in the next meeting.

All scores received by the students are required for the lecturer to deliver in Learning Achievement Card (KHS) that can be accessed in an educational system, namely SIAKAD. The completion of KHS is done in a certain period as it has been set in the academic calendar. The late completion of KHS by the lecturer will cause the students in the course to have a failed score predicted (BL). The students can access their KHS in SIAKAD after filling out an evaluation form of feedback during learning in all courses taken inactive semester. KHS that is given to the students every semester is explains about:

a. Score of every course
b. Grade Point of Semester (GPS/IPS)
c. Grade Point Average (GPA/IPK)
d. Total credits for following semester
e. Remaining time of the study (for each student)

The student's learning progress in the bachelor programme is evaluated to see their academic ability development conducted in three steps. The first step is conducted at the end of the second semester with terms and conditions that if the total credits have not reached 24 credits, and the GPA is less than 2.00, the student will get a first warning announcement letter issued by the Academic, Student, and Public Relation Affairs. The letter is about a warning announcement for the student to get a status revocation as a student of UNJ unless they can fix their academic achievement next semester. The second step of evaluation is executed at the end of the third semester with terms and conditions; if the total credits have not reached 36 credits with the GPA less than 2.00, the student will receive the first warning announcement letter as they have not received any warning announcement letter in the first evaluation step and the second warning announcement letter as they have received the first announcement letter. The third step of learning progress evaluation is completed at the end of the fourth semester with terms and conditions; if the total credits have not reached 48 credits with the grade point average (IPK) less than 2.00, the student will get the first warning announcement letters as they have not received any warning announcement letter in the first and second evaluation step. Their status as a student of UNJ will be revocated if they have received the first and second warning announcement letters. All the warning letters are sent to the student's parents and forwarded to the Faculty and Study Programme. Finally, a student who has completed at least 144 credits, a minimum GPA of 2.0, does not have any grade E, and has grade D, not more than 20% of the total credits, may submit a graduate candidacy evaluation for graduation.

Students' academic master maximum study period is eight semesters or four years with a minimum of 38 credits, particularly for the master programme of biology and chemistry, a total of 46 credits or 122.82 ECTS.

Every student who will complete their study in UNJ is required to:

1. pass all required courses from the study programme,
2. fulfil the total of minimum credits requirement,
3. write a scientific paper or to hold a showcase/exhibition,
4. have a publication, and
5. follow a scientific presentation exam based on a selected education programme.

A scientific paper reports a research study written by the students at the last study period in every selected programme. Each of them will be published in online media. It can't have any plagiarized elements.

The final project in the bachelor programme is that the students must write a thesis which is a student's final project. The thesis guideline (Appendix 2.3) is developed by faculty with the regulation of university and ministry. The thesis topic is related to each study programme specialty. The final project in this thesis provides students with experience researching and communicating their work scientifically. This experience is significant to continue to a higher

level of education or enter the world of work. A thesis is worth four credits points. Seminars following the study programme and pre-thesis seminars are worth two credits each. However, before taking the thesis course, students must first pass the seminars by the study programme and pre-thesis seminar to submit a thesis proposal. The example of a bachelor degree thesis is attached in Appendix 3.3.

The final project of students in the Masters' Study Programme is a thesis with a weight of 6 credits derived from the results of research conducted by students under the guidance of a supervisor. Following Regulation of Ministry of Education, Culture, Research, and Technology Indonesia explains a university or faculty annual academic manuals, study programme curriculum documents, and quality assurance systems issued by the Jakarta State University Quality Assurance Unit (SPM). However, in pre-thesis research, students of the master programme should present a research proposal to the team of a study programme. The thesis defence exam is held when the research article has been presented in a national seminar and accepted in an international indexed journal by stating the thesis advisor's name as to the writer. The example of Master's Degree thesis is attached in Appendix 3.4

A thesis is a form of scientific work, individually, as one of the requirements for obtaining bachelor's and master's degrees. The study programme coordinator coordinates the mechanism for determining supervisors for bachelor and master's programmes. The research topic should be relevant to the supervisor's and co-supervisor's expertise. Students can also choose research topics according to their interests but are still relevant to their supervisors, expertise. A list of students' names who participate in the seminar on thesis proposal can be obtained from the academic system (http://siakad.unj.ac.id).

Before conducting research (a final thesis, bachelor thesis or master thesis), students must pass a proposal seminar. The requirement for submitting a proposal seminar is that students have completed a minimum of 120 credits for undergraduate or 30 credits for masters' degrees. Students present their research plans in the proposal seminar before the supervisors and examiners. The proposal is declared passed and feasible, and the research can be continued. Students must always discuss the results of their research with supervisors and co-supervisors. After completing the research, students are allowed to submit an examination of the research result and must be presented. Requirements to apply for the research results exam, undergraduate students have passed a minimum of 140 credits, a TOEP score of 425, and are registered as active students in the current semester, as evidenced by proof of tuition payment. Masters' students have passed a minimum of 32 credits, have submitted their articles to reputable national journals accredited by Sinta 2 or international journals indexed by Scopus or web of science, and are registered as active students in the current semester as evidenced by proof of tuition fees.

The thesis is defended in a final exam in front of a team of two expert examiners and a supervisor. It is led by the Study Programme Coordinator or a lecturer assigned by the Study Programme Coordinator following applicable regulations. The passing score of the thesis examination is a grade of B for undergraduate and master's programmes. If the passing grade is below a grade of B, the student must be re-examination according to the scheduled time. The student, who was declared pass on thesis in bachelor and magister programme, must register for graduation to get bachelor or master certificate, academic transcripts, and SKPI.

The contribution of courses calculates the PLO achievement of each study programme. The calculation of PLO achievement represents the students who achieved an excellent and reasonable level. The range of PLO achievement is 70 to 100 (Appendix 3.5).

CRITERIA 4: RESOURCES

4.1 Staff

The Faculty of Mathematics and Natural Science (FMIPA) UNJ is led by a dean and assisted by three vice of Dean during their period of leadership. The first vice of Dean is responsible for academic affairs; the second vice of Dean is responsible for academic and facility affairs; and the third vice of Dean is responsible for the student, alumni, and partnership affairs. The faculty also has an office staff that include lecturers and academic staff. There have been 126 lecturers and 47 academic staff (laboratory/PLP and administration staff). The lecturers are grouped into 10 Bachelor's study programmes and 4 Master's study programmes.

By having 2140 students, FMIPA has a total ratio between lecturers and students 1:18. It is sufficient to give academic services from the teaching process, academic advice, final project (thesis), research, and other academic supporting and student affairs activities. This ratio is also supported by the working load of the lecturer on average, which is still in a normal range of 40 hours (about one and a half days) per week (12-13 credits/week) as stated in the Announcement Letter from the Directorate General of Higher Education No. 3298/D/T/99. 122 lecturers are civil servants, and four lecturers are employed at the university (DPK).

The permanent lecturers are being promoted and assigned as academic staff with a minimum of 20 hours of workload per week (Decree of rector No. 469/UN39/KP.09.03/2021). The lecturers of FMIPA UNJ are selected based on their expertise in the study programmes. The total number of lecturers based on the study programme group is presented in Figure 4.1 below:

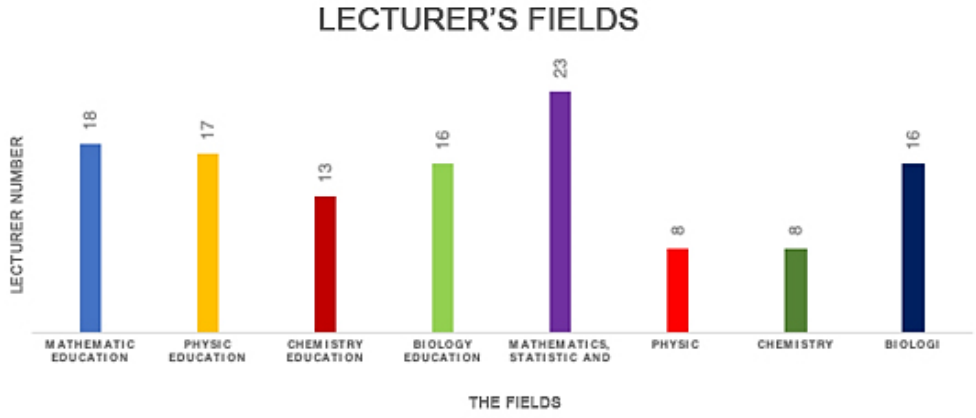

Figure 4. 1 Data of lecturers' fields or expertise

Lecturer staff is planned based on the strategic plan of the university. The plan was designed based on consideration of student-lecturer ratio, research, community service plan, learning system trends, faculty strategic plan, and Programme Learning Outcome. Recruitment of new staff members, including lecturers and academic staff, is done with two pathways. The first pathway is central recruitment by the Indonesian Ministry of Education and Culture, Research and Technology and the second one is done locally by the university. The university's local requirement comprises BLU (permanent staff) and *DPK* (temporary staff). Regulation on staff recruitment is held based on laws of civil servant's candidate selection, such as Laws No.5 the Year 2014; Laws No.30 the Year 2014; Decree of Ministry of Research, Technology, and Higher Education No.42 the Year 2018; Decree of UNJ Rector No.

380/SP/2011. The recruitment and promotion process for employed lecturers (DPK) and honorary academic staff are held based on Laws and Regulations as in the Rector decree (Appendix 4.1).

Planning for academic staff based on workload analysis and staff need map which follows steps as shown in Figure 4.2

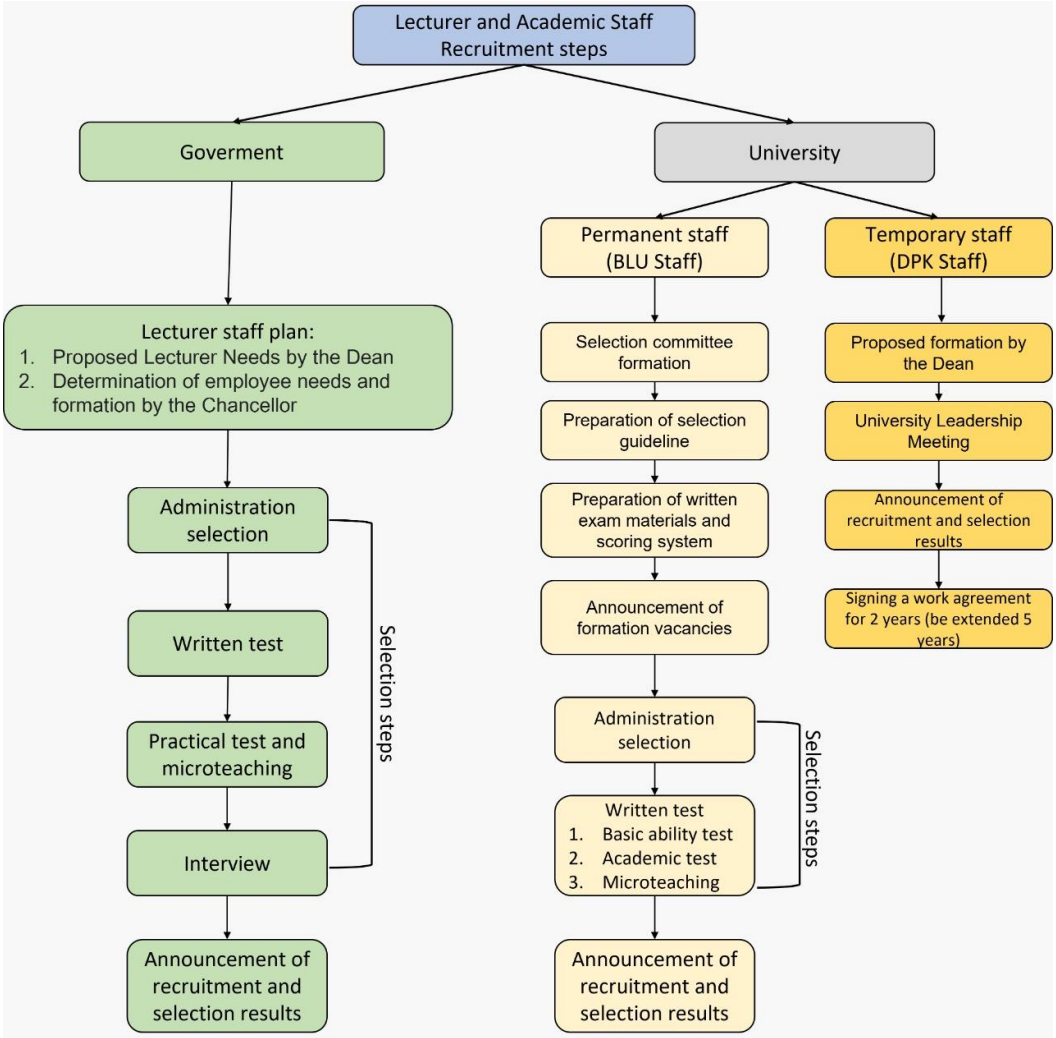

Figure 4. 2 Lecturer and Academic Staff Recruitment Systems

The academic services from lecturers to students are assisted by academic staff in terms of admission services. The types of service include making research permission letters, conducting observation, visits, field study, borrowing instruments and rooms, etc. The services have been conducted online for the lecturers and the students from every study programme. The students' satisfaction with the lecturers' performance is the primary measurement for developing the study programme. There are 3.4 out of 4 scales for academic services satisfaction from the survey results. The highest survey result is the students' learning achievements card (KHS) with 3.52 scale. Average results for the academic services' satisfaction are shown in Figure 4.3 below:

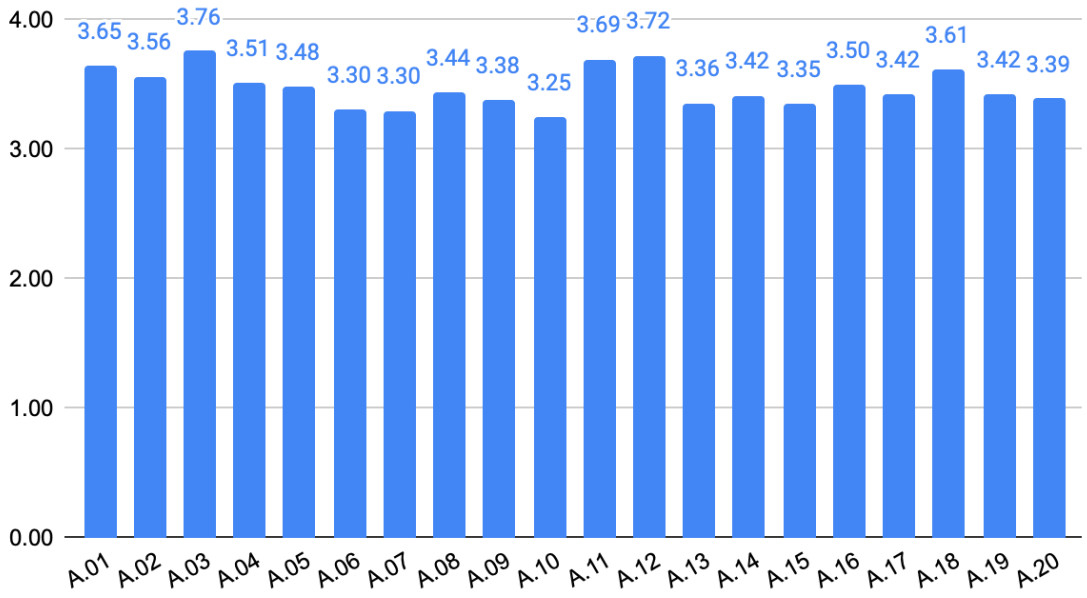

Figure 4. 3 Average Scales of Academic Service Satisfactions

(A.01 Selection, A.02 KRS (Student's Course Plan's Card), A.03 Learning Activity, A.04 Score Revision, A.05 PKM (Students' Creativity Events), A.06 PPL (Field Study Practice), A.07 PKL (Field Work Practice), A.08 Internship (MBKM), A.09 Field Study (KKN), A.10 Semester on Leave, A.10 KHS (Student's Learning Achievement Card), A.11 Mid-term Exam, A.12 Final-Term Exam, A.13 Thesis Advising Assistance, A.14 Thesis Defense, A.15 Thesis Registration, A.16 Judicium, A.17 Graduation, A.18 Legalization A.19 Career Assistance, A.20 SKPI

4.1.1 Lecturer of Chemistry Study Programme

There are seven lecturers and 255 students in the Chemistry Study Programme. The ratio of lecturers and students is 1:19.6 with an average workload of 37.08; therefore, the numbers of lecturers are adequate to hold the teaching and learning activities and other supporting activities. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.1). The lecturers of the chemistry study programme have qualifications of a doctoral degree (71.4%) and master's degree (28.6%), as shown in Table 4.1 below

Table 4. 1 Lecturer of Chemistry Study Programme

No	Name	Background of Education	Competence	Course	Study Programme/Degree
1	Dr. Fera Kurniadewi, M.Si.	Ph.D.	Organic Chemistry	Stereochemistry, Laboratory Understanding, Secondary Metabolite Organic Chemistry, Thesis, Seminar of Thesis Proposal, STEM, Organic Chemistry, Organic Substance Reaction and Mechanism, Structure Determination of Natural Substance.	Chemistry (S1), Chemistry Education (S2)
2	Dr. Yusmaniar, M.Si	Ph.D.	Physical Chemistry	Practicum of Chemical Thermodynamics, Basic Chemistry II, Chemical Thermodynamics, Research Methodology, Practicum of Basic Chemistry II, Polymer Chemistry, Kinetics of Chemistry Reaction and its practicum,	Chemistry (S1), Chemistry Education (S2)
3	Dr. Zulhipri, M.Si.	Ph.D.	Organic Chemistry	Determination of Organic Molecule Structure, Practicum of Isolation and Characterization of Organic Substance, Stereochemistry, Practicum of Organic Synthesis and Compound, Organic Chemistry, Practicum of Organic Chemistry, Practicum of Isolation and Characterization of Organic Substance	Chemistry (S1)

No	Name	Background of Education	Competence	Course	Study Programme/Degree
4	Dr. Setia Budi, M.Sc.	Ph.D.	Inorganic Chemistry	Nanoscience and Nanomaterial, Material Chemistry, Research Methodology, Practicum of Basic Structure of Inorganic Chemical Reaction, Coordination Chemistry, Practicum of Coordination Chemistry, Synthesis and Characteristics of Nanomaterial, Applied Electrochemistry, Practicum of Coordination Chemistry, Nanoscience and Nanotechnology	Chemistry (S1), Chemistry Education (S2)
5	Dr. Hanhan Dianhar, M.Si.	Ph.D	Organic Chemistry	Chemistry Seminar, Practicum of Identification of Organic Substance, English Basic Chemistry II, Current Issues of Organic Chemistry, Basic Chemistry I, Mathematic of Chemistry, Practicum of Organic Chemistry, Organic Substance and Mechanism	Chemistry (S1)
6	Irma Ratna Kartika, M.Sc,Tech	M.Sc, Tech	Biochemistry	English, Structure and Function of Biomolecule, Biotechnology, Biochemistry of Food Ingredients	Chemistry (S1)
7	Yussi Pratiwi, M.Sc.	M.Sc	Analytical Chemistry	English, Chemical Separation, Practicum of Chemical Instrument Analysis, English for Chemistry, Practicum of Basic Chemistry II, Seminar of Chemistry, Mathematic of Chemistry, Analysis of Quantitative	Chemistry (S1)

No	Name	Background of Education	Competence	Course	Study Programme/Degree
				and Qualitative Chemistry.	

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.1). The research results are published in national and international journals or proceedings (Appendix 4.4.1). Data of several publications in the last three years by the lecturers can be found in Figure 4.4 below:

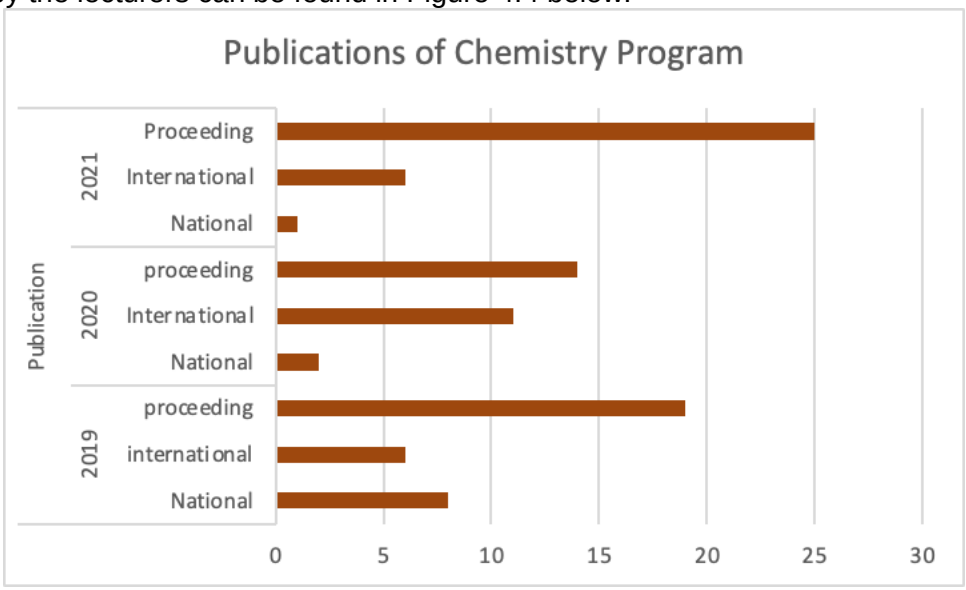

Figure 4. 4 Number of publications by the lecturers in the Chemistry study programme

Besides the research activity, the lecturers also get their copyrights from their self-development. Since the last three years, there have been five copyrights for intellectual equity.

4.1.2 Lecturer of Chemistry Education Study Programme

There are 13 lecturers and 394 students in the Chemistry Education study programme. The ratio of lecturers and students is 1: 30.3 with an average workload of 32.75; therefore, the numbers of lecturers are adequate to hold the teaching and learning activities and other supporting activities. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.2). The lecturers of chemistry education study programme have qualifications of doctor's degree (53.8%) and master's degree (46,2%) with two lecturers who are currently continuing their doctoral study as shown in Table 4.2 below:

Table 4. 2 Lecturers of Chemistry Education Study Programme

No.	Name	Background of Education	Competence	Course	Study Programme
1	Dr. Maria Paristiowati, M.Si.	Dr	Physical Chemistry	Chemical Thermodynamics, Information Technology in Chemistry, Practice Teaching Skills, Microteaching, ICT in Chemistry, Learning media, Educational Professional, Chemicals Kinetics, Review of Chemistry Curriculum	Chemistry Education
2	Dr. Agung Purwanto, M.Si.	Dr	Inorganic Chemistry	Atomic structure and structure of inorganic compounds, Important Concepts in Physical Chemistry and Inorganic Chemistry, Philosophy of Science, Environmental Chemistry, Indexed Scientific Article Writing Research Methodology, Big Data and Coding in Population and Environmental Education, Practice Teaching Skills, Structure and Basics of Inorganic Reactions, Environmental Education, Elemental Chemistry	Chemistry Education
3	Dr. Achmad Ridwan, M.Si.	Dr	Physical Chemistry	Statistics, Research Methodology, Test Management, Current issues in Chemistry Education, Chemical Bond, Advanced Research Methodology, Learning Assessment and Evaluation, Instrument Development, Assessment and Measurement of Chemistry Education, Symmetry and Group Theory	Chemistry Education
4		Dr			

No.	Name	Background of Education	Competence	Course	Study Programme
	Dr. Moersilah, M.Si.		Analytical Chemistry	Essential Concepts in Analytical Chemistry and Environmental Chemistry, Chemistry Analysis Instruments, Chemical Separation, Qualitative and Quantitative Analysis Chemistry, Practice Teaching Skills, Microteaching, Instrument Chemistry	Chemistry Education
5	Dr. Irwan Saputra, M.Si.	Ph.D	Biochemistry	Basic Chemistry, Biomolecular Metabolism, Structure and Function of Biomolecules, Analysis of Halal Products and their alternative compounds	Chemistry Education
6	Yuli Rahmawati, M.Sc., Ph.D	Ph.D	Chemistry Education	Learning Environment, Research Methodology, Research Qualitative Methodology, Practice Teaching Skills, Data Analysis Design, Learning Assessment and Evaluation, Indexed Scientific Article Writing, Learning of Natural Sciences, Qualitative data Analysis, Pre-Thesis Seminar, Misconceptions in Chemistry Learning, Learning Planning and Management, Study the Chemistry Curriculum, STEM.	Chemistry Education
7	Dr. Darsef, M.Si.	Dr	Physical Chemistry	Mathematical Chemistry, Olympism, Basic Natural Science, Practice Teaching Skills, Molecular Spectroscopy, Microteaching, Entrepreneurship, Environmental Education, Chemical Kinetics	Chemistry Education

No.	Name	Background of Education	Competence	Course	Study Programme
8	Dra. Tritiyatma Hadinugraha , M.Si.	M.Si	Analytical Chemistry	Chemistry Analysis Instruments, Chemical Separation, Qualitative and Quantitative Analysis Chemistry, Practice Teaching Skills, Microteaching, Instrument Chemistry	Chemistry Education
9	Arif Rahman, M.Sc.	M.Sc	Inorganic Chemistry	Atomic structure and structure of inorganic compounds, Structure and Basics of Inorganic Reactions, Bioinorganic, Elemental Chemistry, Basic natural science	Chemistry Education
10	Ella Fitriani, M.Pd.	M.Pd	Chemistry education	Microteaching, English for chemistry, Statistics, Chemistry Education Seminar, Practice Teaching Skills, Learning Media, Chemical Literature	Chemistry Education
11	Edith Allanas, M.Pd.	M.Pd	Chemistry education	Basic Chemistry, Practice Teaching Skills, General Chemistry, Safety, Health, and Security of Laboratory Work, Microteaching, Entrepreneurship, Laboratory Management, Olympism	Chemistry Education
12	Elma Suryani, M.Pd.	M.Pd	Chemistry Education	Basic Chemistry, Basic Natural Science, Practice Teaching Skills, Microteaching, Learning Environment, Statistics, Basic Natural Science	Chemistry Education
13	Elsa Vera Nanda, M.Si.	M.Si	Organic Chemistry	Organic Chemistry, Basic Chemistry, Organic Compound Reactions and Mechanisms, Identification and synthesis of Organics, Isolation & Characterization of Organic Compounds	Chemistry Education

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.2). The research results are published in national and international journals or proceedings (Appendix 4.4.2). Data of the number of publications in the last three years by the lecturers can be found in Figure 4.5 below:

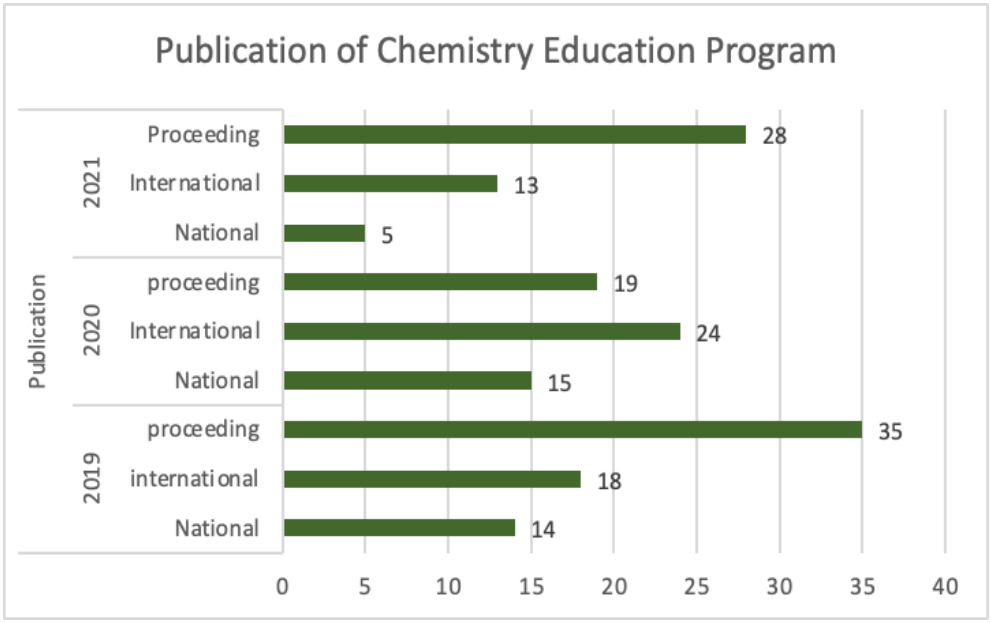

Figure 4. 5 Number of publications by the lecturers in the Chemistry Education study programme in the last three years

Besides the research activity, the lecturers also get their copyrights from their self-development. Since the last three years, there have been 34 copyrights for intellectual equity.

4.1.3 Lecturer of Master's degree of Chemistry Education Study Programme

There are five lecturers and 44 students in the Master of Chemistry Education study programme. The ratio of lecturers and students is 1: 8.8 with an average workload of 45.98; therefore, the number of lecturers is adequate to hold the teaching and learning activities and other supporting activities but with a high workload. All the lecturers in this study programme have structural positions at the university level. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.3). The lecturers of the Master of Chemistry Education Study programme have qualifications of doctoral degree as shown in Table 4.3 below:

Table 4. 3 Lecturers of master's degree of Chemistry Education Study Programme

No	Name	Background of Education	Competence	Course	Study Programme / Degree
1	Prof. Dr. Erdawati, M.Sc.	Ph.D in Chemistry	Analytical Chemistry	Scientific Writings	Chemistry Education (S2)
				Chemistry Learning Design	Chemistry Education (S2)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Chemical Separation	Chemistry Education (S2)
				Green Chemistry	Chemistry Education (S2)
				Statistics	
				Environment Chemistry	
				Practicum of Chemistry Separation	
				Practicum of Analysis of Qualitative and Quantitative Chemistry	
				Practicum of Chemical Instrument Analysis	
				Important Concept in Analytical Chemistry and Environment Chemistry	Chemistry Education (S2)
2	Prof. Dr. Muktiningsih, M.Si.	Ph.D in Chemistry	Biochemistry	Statistics for Education	Chemistry Education (S2)
				Business Intelligence	
				Practicum of Structures and Functions of Biomolecule	
				Microbiology	
				Structures and Functions of Biomolecule	
				Microplastics	
				Statistics	
				Medical Biochemistry	

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Metabolism of Biomolecule	
				Biotechnology	
				An essential concept in Biochemistry and Organic Chemistry	Chemistry Education (S2)
				Current Issues in Chemistry and Chemistry Education	Chemistry Education (S2)
3	Prof. Dr. Ucu Cahyana, M.Si.	Ph.D In Management of Education	Management of Education	Chemistry References	
				Science Technology Engineering Mathematics (STEM)	
				Chemical Elements	
				Learning Design of Chemistry	Chemistry Education (S2)
				New Orientation in Education	Chemistry Education (S2)
				Methodology of Research in Education	Chemistry Education (S2)
				Philosophy of Science	Chemistry Education (S2)
4	Dr. Sukro Muhab, M.Si.	Ph.D In Management of Education	Management of Education	Atomic Structures and Inorganic Substance Structures	
				Chemistry Learning Evaluation	Chemistry Education (S2)
				School Management	
				Practicum of Structure and Basic of Inorganic Reaction	
				Basic of Inorganic Reaction	

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Planning and Organizing a Learning Activity	
				Chemistry Learning, Analysis, and its Implementation	Chemistry Education (S2)
5	Dr. Afrizal, M.Si.	Ph.D in Chemistry	Physical Chemistry	Field Study Practice	
				Practicum of Chemistry Kinetics	
				Thesis	Chemistry Education (S2)
				A misconception in Chemistry Learning	Chemistry Education (S2)
				Thesis Seminar	Chemistry Education (S2)
				Scientific Writings of Chemistry	Chemistry Education (S2)
				Practicum of Chemistry Thermodynamics	
				Chemistry Thermodynamics	
				Solid Chemical	
				Mathematics for Chemistry	
				International Journal Article Review	Chemistry Education (S2)
				Information Technology in Chemistry Learning	Chemistry Education (S2)

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.3). The research results are published in national and international journals or proceedings (Appendix 4.4.3). Data of the number of publications in the last three years by the lecturers can be found in Figure 4.6 below:

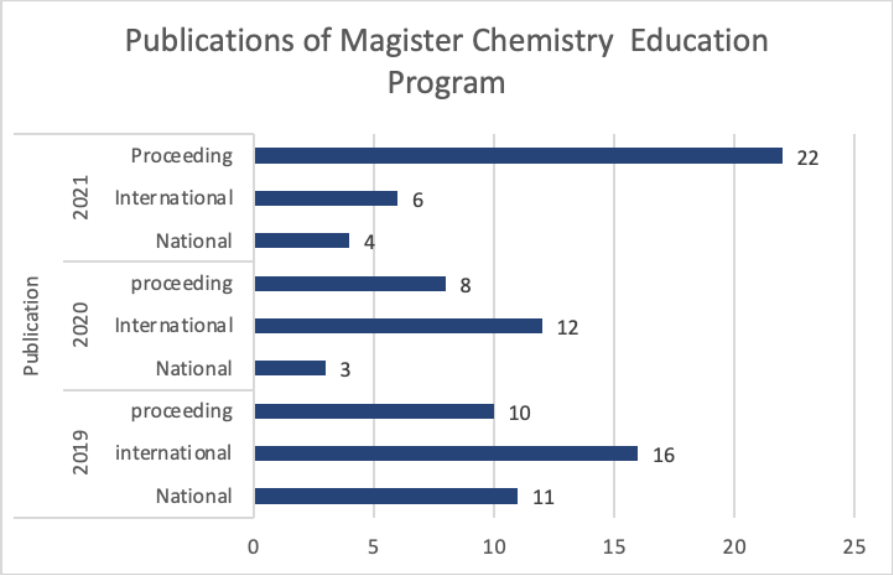

Figure 4. 6 Number of publications by the lecturers in Master's Degree of Chemistry Education study programme in the last three years

Besides the research activity, the lecturers also get their copyrights from their self-development. Since the last three years, there have been 26 copyrights for intellectual equity.

4.1.4 Lecturer of Biology Study Programme

There are 16 lecturers and 167 students in the Biology study programme. The ratio of lecturers and students is 1: 10.44 with an average workload of 30.53; therefore, the numbers of lecturers are adequate to hold the teaching and learning activities and other supporting activities. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.4). The lecturers of biology study programme have qualifications or doctoral's degree (50%) and master's degree (50%) as shown in Table 4.4 below:

Table 4. 4 Lecturer of Biology Study Programme

No	Name	Background of Education	Competence	Course	Study Programme / Degree
1	Dr. Ratna Komala, M.Si.	Ph.D	Ecology	Environmental Science, Biodiversity, and systematics of invertebrate and vertebrate, AMDAL, Basic Ecology, Ocean Ecology, Limnology.	Biology Education (S1), Master of Biology Education (S2)
2	Dr. Rini Puspitaningrum, M.Biomed.	Ph.D	Biochemistry	Biochemistry, Cell Biology, Molecular Biology, Enzymology,	Biology Education (S1), Master of

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Fundamentals of Bioinformatic	Biology Education (S2)
3	Dr. Dalia Sukmawati, M.Si.	Ph.D	Microbiology	Laboratory of Health and Occupational Safety (K3), Microbiology, Micrology, Biodiversity, Fungus, Biology of Khamir, Biosystematics of Microorganism	Biology (S1), Biology Education (S1)
4	Dr. Adisyahputra, M.Si.	Ph.D	Physiology of Plants	General Biology, Genetics, Cell Biology, Experiment Planning, Physiology of Plants, Science of Land Nutrients, Ecophysiology of Plants	Biology (S1), Biology Education (S1), Master of Biology Education (S2)
5	Agung Sedayu, S.Si., M.Sc.	M.Sc	Botany	General Biology, Biodiversity, and Cryptogram Systematics, BS Phanerogam, Evolution, Fundamentals of Bioinformatics, Urban Biodiversity	Biology (S1), Biology Education (S1)
6	Dr. Elsa Lisanti, S.Pt.,M.Si.	Ph.D	Physiology of Animal	General Biology, Structure of Animal Development, Animal Physiology, Animal Care for Scientific Experiment, Reproduction Biology	Biology (S1), Biology Education (S1), Master of Biology Education (S2)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
7	Dr. Reni Indrayanti, M.Si.	Ph.D	Physiology of Plant	Structure of Plant Development, Research Methodology, Physiology of Plant, Plant Tissue Culture, Foundations of Horticulture, Plant Microbial Pathogen, Virology of Plant, Biotechnology of Plant	Biology (S1)
8	Sri Rahayu, Ns. S.Kep., M.Biomed	M.Biomed	Biochemistry	Olympism, English, Biochemistry, Biology of Human, Science of Nutrition and Health, Anatomy of Human Physiology	Biology (S1), Biology Education (S1)
9	Dr. Tri Handayani Kurniati, M.Si.	Ph.D	Microbiology	Biochemistry, Microbiology, Bacteriology, Environmental Microbiology, Industry and Food Microbiology, Genetics	Biology (S1), Biology Education (S1), Master of Biology Education (S2)
10	Dr. Yulia Irnidayanti, M.Si.	Ph.D	Physiology of Animal	Cell Biology, Molecular Biology, Biodiversity and Systematics of Invertebrate/Vertebrate, Teratology, Microtechnic of Animal	Biology (S1)
11	M. Isnin Noer, S.Si., M.Si.	M. Si	Ecology	Environmental Science, Biodiversity and Biosystematics of Invertebrate, BS Vertebrate, Research Methodology, Basic	Biology (S1)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Ecology, Urban Biodiversity	
12	Pinta Omas Pasaribu, S.Si., M.Si.	M.Si	Physiology of Plant	General Biology, Laboratory of Health and Occupational Safety (K3), Genetics, Experiment Planning, BS Phanerogam, Physiology of Plant	Biology (S1)
13	Rizal Koen Azharo, S.Si., M.Si.	M.Si	Physiology of Plant	General Biology, Biodiversity and Cryptogram Systematics, Bs Phanerogam, Plant Tissue Culture, Virology of Plant, Phycology	Biology (S1)
14	Rizky Priambodo, S.Si., M.Si.	M.Si	Physiology of Plant	General Biology, Genetics, Statistics, Cell Biology, Molecular Biology, Evolution, Biotechnology of Plant, Foundations of Bioinformatics	Biology (S1)
15	Vina Rizkawati, S.Si., M.Sc.	M. Sc	Entomology	English, Environmental Science, Ecology, Biodiversity of A vertebrate Systematics, Entomology, Foundations of Horticulture	Biology (S1)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
16	drh. Atin Supiyani, M.Si.	M.Si	Physiology of Animal	Experiment Planning, Physiology of Animal, Animal Care for Scientific Experiment, Science of Animal Behavior, Bioethics of Animal, Immunology, Endo and Ectoparasitology of Animal	Biology (S1)

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.4). The research results are published in national and international journals or proceedings (Appendix 4.4.4). Data of the number of publications in the last three years by the lecturers can be found in Figure 4.7 below:

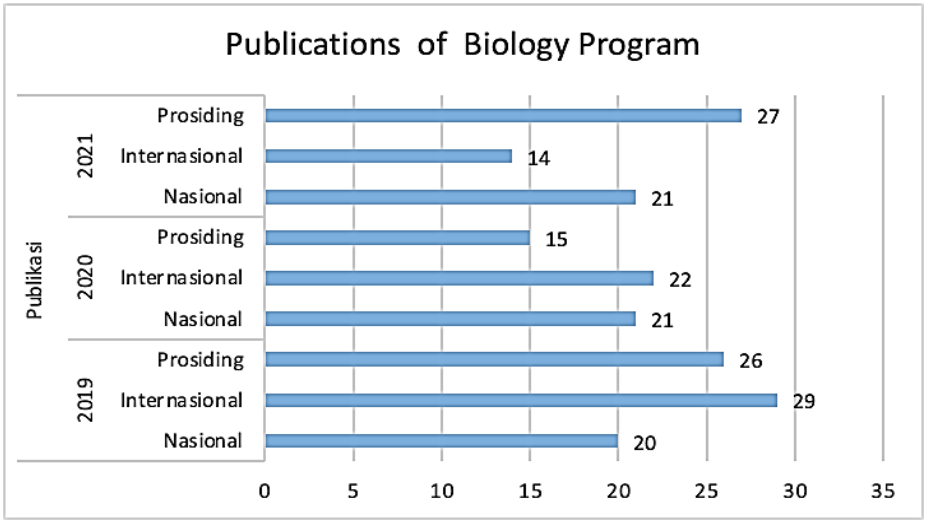

Figure 4. 7 Number of publications by the lecturers in Biology study programme

Besides the research activity, the lecturers also get their copyrights from their self-development. There were 38 copyrights in 2019 and 11 copyrights in 2020 for intellectual equity.

4.1.5 Lecturer of Biology Education Study Programme

There are 11 lecturers and 405 students in the Biology Education study programme. The ratio of lecturers and students is 1: 36.8 with an average workload of 32.36; therefore, the numbers of lecturers are adequate to hold the teaching and learning activities and other supporting activities. The ratio of students and lecturers is slightly higher than the average

ratio. To solve this problem, sharing resources with other study programmes is applied to fulfil the needs of lecturers based on their qualifications. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study. During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.5). The lecturers of biology education study programme have qualifications of doctor's degree (9.1%) and master's degree (90.9%) as shown in Table 4.5 below:

Table 4. 5 Lecturers of Biology Education Study Programme

No	Name	Background of Education	Competence	Course	Study Programme / Degree
1	Dr. Rusdi, M.Biomed.	Ph.D	Physiology of Animal	General Biology, Animal Physiology, Immunology, Endocrinology, Physiology of Human Anatomy	Biology Education (S1), Master of Biology Education (S2)
2	Dra. Nurmasari Sartono, M.Biomed.	M.Biomed	Histology	General Biology, Structure of Animal Development, Learning Method and Evaluation, Nutrition and Health, Learning Media	Biology Education (S1)
3	Drs. Refirman Dj., M.Biomed.	M.Biomed	Parasitology	Cell Biology, Physiology of Animal, Physiology of Animal Anatomy, Curriculum Review	Biology Education (S1)
4	Dra. Ratna Dewi Wulaningsih, M.Si.	M.Si	Structure of Plant Development	General Biology, Structure of Plant Development, Microtechnic, Curriculum	Biology Education (S1)
5	Eka Putri Azrai, S.Pd., M.Si.	M.Si	Ecology	General Biology, Ecology, Physiology of Plant	Biology Education (S1)
6	Dra. Yulilina RD., M.Biomed.	M. Biomed	Genetics	General Biology, Physiology of Animal, Genetics	Biology Education (S1)
7	Erna Heryanti, S.Hut., M.Si.	M.Si	Tropical Forest Ecology	General Biology, Ecology, Entrepreneurship	Biology Education (S1)
8	Ade Suryanda, S.Pd., M.Si.	M.Si	Coastal and Ocean Ecology	General Biology, Ecology	Biology Education (S1)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
9	Annisa Agus Wulan Utami, M.Si	M.Si	Microbiology	General Biology, Microbiology, Biotechnology	Biology Education (S1)
10	Daniar Setyo Rini, S.Pd., M.Pd.	M.Pd	Biology Education	General Biology, Theory of Teaching and Learning, Technology of Learning	Biology Education (S1)
11	Nailul Rahmi Aulia, S.Si., M.Si.	M.Si	Biology	General Biology, Crypto Botany and Phanerogam, Physiology of Plant, Genetics	Biology Education (S1)

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.5). The research results are published in national and international journals or proceedings (Appendix 4.4.5). Data of the number of publications in the last three years by the lecturers can be found in Figure 4.8 below:

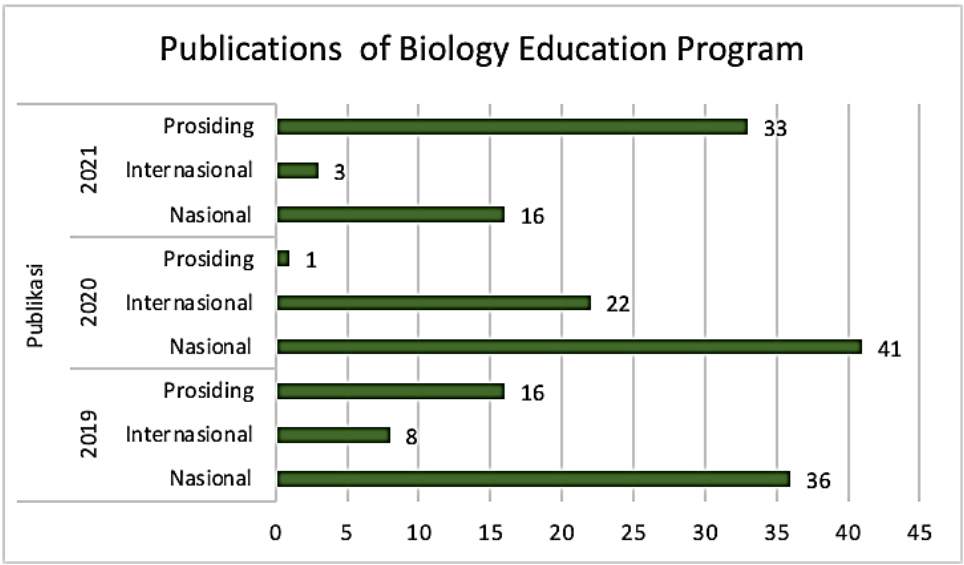

Figure 4. 8 Number of publications by the lecturers in the Biology Education study programme

Besides the research activity, the lecturers also get their copyrights from their self-development. Since the last three years, there have been 13 copyrights for intellectual equity.

4.1.6 Lecturer of master's degree of Biology Education Study Programme

There are six lecturers and 52 students in the Master of Chemistry Education study programme. The ratio of lecturers and students is 1: 10 with an average workload of 45.80; therefore, the number of lecturers is adequate to hold the teaching and learning activities and other supporting activities but with a high workload. All the lecturers in this study programme

have structural positions at the faculty (3rd Vice of Dean). During their primary tasks as educators, the lecturers earn their academic qualifications from formal or informal education to be competent and fit in with their field of study (Appendix 4.2.6). The lecturers of the Master of Chemistry Education Study programme have qualifications of doctor's degree as shown in Table 4.6 below:

Table 4. 6 Lecturers of master's degree of Biology Education Study Programme

No	Name	Background of Education	Competence	Course	Study Programme / Degree
1	Prof. Dr I Made Putrawan	Ph.D	Environment Education	Statistics, Research Methods, Theory of Teaching and Learning	Biology Education (S1), Master of Biology Education (S2)
2	Dr. Mieke Miarsyah, M.Si	Ph.D	Environment Management	Learning Evaluation, Learning Media, Structure of Plant Development, Crypto Botany and Phanerogam, Learning Method and Evaluation	Biology Education (S1), Master of Biology Education (S2)
3	Dr. Diana Vivanti, M.Si	Ph.D	Evironment Education	Environment Ecology and Conservation, Crypto Botany and Phanerogam, Ecology	Biology Education (S1), Master of Biology Education (S2)
4	Dr. Supriyatin, M.Si	Ph.D	Management	Biology of Learning Design, School-Base Management, Biochemistry, Cell Biology, Physiology of Plant	Biology Education (S1), Master of Biology Education (S2)
5	Dr. Hanum Isfaeni, M.Si.	Ph.D	Biology Education	Philosophy of Science, Bioinformatic in Biology Learning, Information Technology in Biology Learning	Biology Education (S1), Master of Biology Education (S2)
6	Dr. Rizhal Hendi Ristanto, M.Pd	PhD	Biology Education	Biology Learning Design, Evaluation, Media, General Biology, Crypto Botany and Phanerogam, Theory of Teaching and Learning, Learning Method and	Biology Education (S1), Master of Biology Education (S2)

No	Name	Background of Education	Competence	Course	Study Programme / Degree
				Evaluation, Technology of Learning	

The lecturers' research is directed to support self-development and study programme development (Appendix 4.3.6). The research results are published in national and international journals or proceedings (Appendix 4.4.6). Data of several publications in the last three years by the lecturers can be found in Figure 4.9 below:

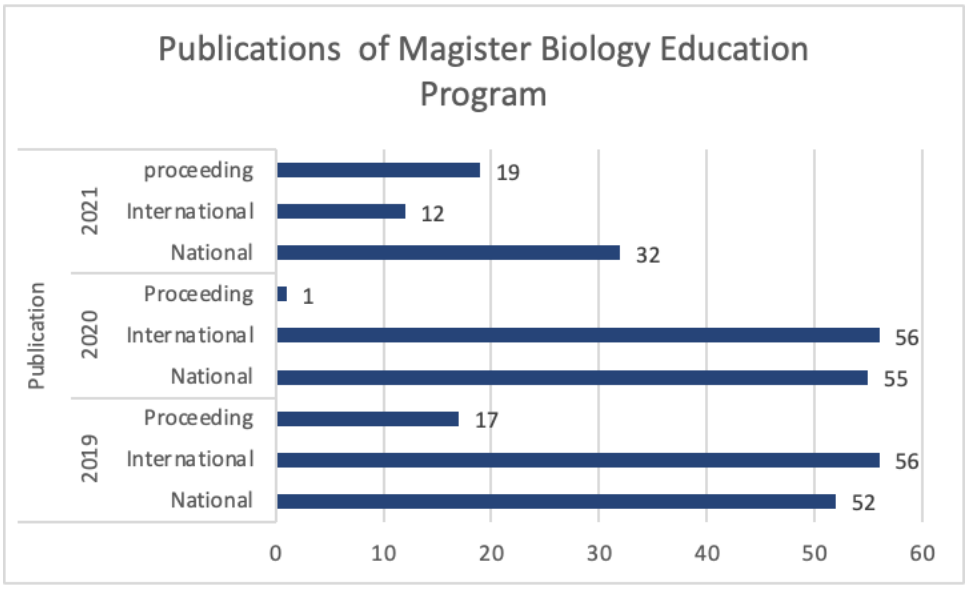

Figure 4. 9 Number of publications by the lecturers in master's degree of Biology Education study programme in the last three years

Based on Figure 4.9, the most published research article by the lecturer is an international publication every year, except in 2021 due to the pandemic situation. However, some research articles are still published in national publications. Besides the research activity, the lecturers also get their copyrights from their self-development. Since the last three years, there have been several copyrights for intellectual equity, such as nine copyrights in 2019 10 copyrights in 2020 and 2021. Those copyrights and publications show that all the research studies and self-development of the lecturers have fit in with their academic qualifications and expertise, supporting the study programme development.

4.1.7 Academic Staff

The staff in FMIPA includes lecturers as well as the academic staff. There is 47 academic staff of FMIPA UNJ consisting of 20 permanent staff and 27 honorary employees/non-permanent staff. The academic staff, mainly the permanent staff, have an educational background from the bachelor's study programme so that their competencies match their job descriptions. The composition of academic staff based on their educational background is presented in Figure 4.10 below:

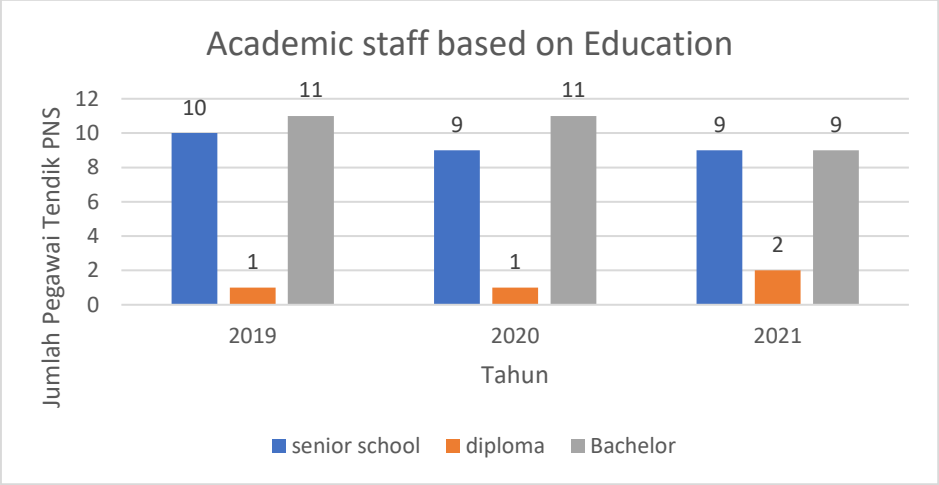

Figure 4. 10 Data of academic staff based on their educational background

Besides the academic staff who are civil servants, FMIPA UNJ also has honorary employees paid from faculty funding. The composition of honorary employees is also from bachelor's degree backgrounds to be competent as expected. The composition of honorary employees can be seen in Figure 4.11.

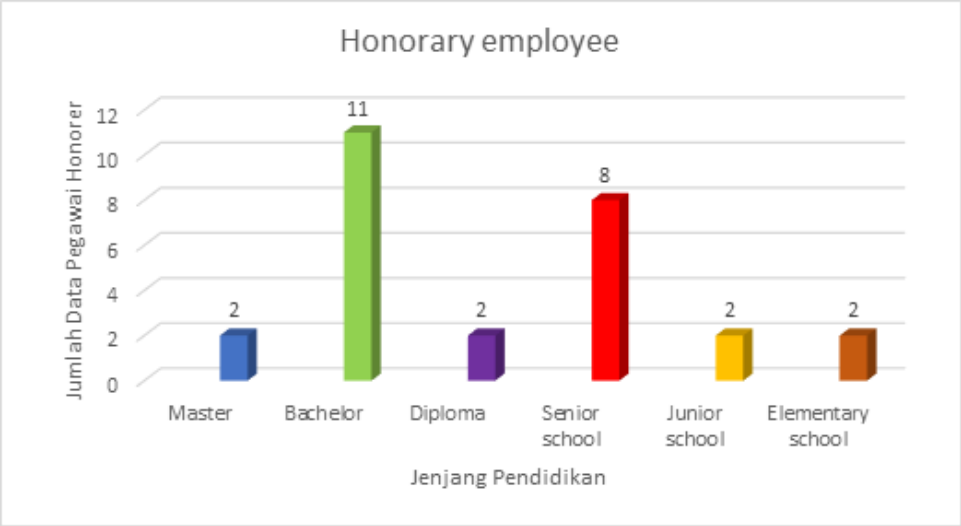

Figure 4. 11 Honorary employees based on their educational backgrounds

4.2 Staff Development

Staff development includes professional and academic position development. The faculty supports the staff to do continuous self-development in professional competency as stated in Regulation of Minister of Research, Technology, and Higher Education No. 44 the Year 2016 about National Standard of Higher Education in article 39 verse 3 points e. For the lecturers, pedagogy competency is also as important as professional competency. The lecturer's professional competency development is completed by partnering with various institutions through research collaboration at the national and international level, training, seminar, guest lecturer, sustainable study, etc. Professional competency development for

teaching staff is also completed through English training, laboratories training, ICT management system training, and accounting management training.

Competency development of professional staff is also conducted by mapping the need analysis, expert's opinion, and scientific advancement. The lecturer then will continue their study by making a letter of permission or letter of duty to the Rector proposed by Dean. Meanwhile, the lecturer and academic staff who participate in the training, seminar, workshop, and so forth will get permission from the Dean only.

The staff development strategy in professional competency has been done by facilitating research activities, and community services for the lecturers through findings received. All lecturers get the same chances both in group and individual projects. On the other hand, the faculty has a partnership with institutions of education development in university as the strategy of pedagogy competency by giving regular training. The training is held to guarantee the staff development keep running and the academic service. Additionally, the faculty plans for the teaching staff to interchangeably get involved in any training based on their area of experts with priority needs.

Academic position development in line with professional development will promote staff individual competencies and expertise. Promotion from lecturer into associate professor and professor done based on *Permenpan* RB 17 Jo 46, 2013 with the requirements as shown in Table 4.7 below:

Table 4. 7 The requirements for academic position promotion

Lecturer Promotion Requirement		
Nu	Lecturer to Associate professor	Associate professor to professor
1	At least two years in a lecturer position	At least two years in an associate professor position
2	Have minimum master's degree	Have a doctorate
3	Meet required credit allowed in education, research, community service and others	Meet required credit allowed in education, research, community service and others
4	Has nationally accredited publication article as the first author for doctor	Has an internationally reputable publication article as the first author
5	Has internationally published article as the first author for master's degree	Approved by University senate
6	Approved by the university senate	Minimum 3 years in doctor degree
		Minimum has ten years teaching experience

4.3 Fund and Equipment

4.3.1 Fund

The funds for faculty operational activity are received from BOPTN (Operational Funds for State University). It is categorized as operational funds for education, student, research, community service, and investment. Table 4.8 presents the information about the faculty funds as follows:

Table 4. 8 Information about the faculty funds

No.	Category of Usage	Faculty Funds - IDR (Euro)				
		2.017	2.018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 6.349.605.171	IDR 7.055.116.857	IDR 7.839.018.730	IDR 8.046.838.300	IDR 8.046.838.300
		EUR 387.326	EUR 430.362	EUR 478.180	EUR 490.857	EUR 490.857
	b. Academic Staff (salary, honorarium)	IDR 1.898.948.785	IDR 2.109.943.094	IDR 2.344.381.216	IDR 2.324.900.275	IDR 2.324.900.275
		EUR 115.836	EUR 128.707	EUR 143.007	EUR 141.819	EUR 141.819
	c. Learning Activity (Materials and Consumable Equipment)	IDR 1.746.613.208	IDR 1.940.681.342	IDR 2.156.312.602	IDR 2.394.978.000	IDR 606.746.000
		EUR 106.543	EUR 118.382	EUR 131.535	EUR 146.094	EUR 37.012
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 297.426.825	IDR 330.474.250	IDR 367.193.611	IDR 216.785.000	IDR 232.733.350
		EUR 18.143	EUR 20.159	EUR 22.399	EUR 13.224	EUR 14.197
3	Research Funds	IDR 1.816.725.000	IDR 1.817.900.000	IDR 1.919.825.000	IDR 1.594.664.000	IDR 2.092.988.000
		EUR 110.820	EUR 110.892	EUR 117.109	EUR 97.275	EUR 127.672
4	Community service (PKM) Funds	IDR 640.525.000	IDR 640.700.000	IDR 643.575.000	IDR 635.000.000	IDR 635.000.000
		EUR 39.072	EUR 39.083	EUR 39.258	EUR 38.735	EUR 38.735
5	Human Resource Infestations Fund	IDR 365.202.270	IDR 405.780.300	IDR 450.867.000	IDR 302.489.000	IDR 293.080.000
		EUR 22.277	EUR 24.753	EUR 27.503	EUR 18.452	EUR 17.878
6	Facility Infestations Fund	IDR 375.820.560	IDR 417.578.400	IDR 463.976.000	IDR 754.523.000	IDR 232.733.350
		EUR 22.925	EUR 25.472	EUR 28.303	EUR 46.026	EUR 14.197
7	Infrastructure Infestation Fund	IDR 175.515.525	IDR 195.017.250	IDR 216.685.833	IDR 190.531.000	IDR 219.047.000
		EUR 10.706	EUR 11.896	EUR 13.218	EUR 11.622	EUR 13.362
Total		**IDR 11.209.132.344**	**IDR 12.454.591.493**	**IDR 13.838.434.992**	**IDR 14.231.044.575**	**IDR 14.684.066.275**
		EUR 683.757	**EUR 759.730**	**EUR 844.145**	**EUR 868.094**	**EUR 895.728**

The total amount of money from the faculty funds above is significant and consistent enough to support teaching and learning activities and other supported activities. Fourteen study programmes received the funds proportionally based on the total number of students from some operational education funds listed in the Table 4.8. The total funds are given consistently to support academic activities. Study programme development is set at the end of the year to implement FMIPA working progress in the research area the following year. Community service is ranked at the highest position in UNJ so that the faculty gets a 30% allocation of funding. Faculty also supports funding for lecturers in developing their knowledge and skill by attending International or national seminars, conferences, and workshops through grants included in research and community service funding.

Lecturers' developments are provided by several programmes such as scientific writing, English for teaching, PEKERTI (Design Learning), Applied Approach (Lesson Material Development), research proposal writing, community service proposal writing etc. Staff

development also provides academic staff through several programmes such as introductory workshops regarding their specialization, Occupational Health and Safety for laboratory training, public speaking etc.

The financial management system is carried out through a centralized mechanism at the university. Efforts to overcome the lack of funds can be carried out through revisions that are carried out every three months. In the budgeting of each study programme, the allocation follows the educational burden it bears. Each study programme has autonomy in preparing its programme of activities and budget. However, because administratively, the smallest unit is the faculty, the programme and budget preparation are carried out in the coordination of the faculty. The operational and development funds allocated for the Faculty of Mathematics and Natural Sciences and the study programme in it so far are considered adequate in carrying out study programmes according to the mission and targets every year. The annual budget work plan system includes (1) preparation of financial plans, programmes and budgets; (2) preparation of university financial development plan; (3) implementation of planning under coordination within the university; (4) preparation of reports on the implementation of plans, programmes and budgets; and (5) monitoring and evaluation. Monitoring and implementation include plans, programmes, budgets, and academic and student activities involving all levels from study programmes, faculties, bureaus, institutions, and units. The university's Chancellor allocates funds for operational activities (education, research, community service, including salaries and wages, operational costs of learning materials, indirect operational costs). To achieve financial standards, the university has developed strategies as follows:

1. University and faculty leaders maintain good coordination with all faculties, institutions, and existing units in terms of planning, managing and being accountable for all receipts and disbursements of existing funds.

2. Ensure the existence of policy documents in the form of written regulations/decisions from the university's Chancellor accompanied by a decree and technical instructions as signs for implementing financial standards.

3. Availability of human resources in the financial sector who have the qualifications and competencies to carry out a series of implementations of the financial system by carrying out employee recruitment and human resource development in the financial sector (training, certification, workshops, further studies);

4. An accountable and reliable financial information system to support integrated planning, finance, accounting and reporting functions to support the realization of the *Tridharma* of Higher Education; and

5. Strengthening the Internal Monitoring Unit to ensure that all risks of errors in the implementation of the financial system can be mitigated so that the target for achieving educational services can be carried out correctly.

The determination of the work plan for the study programme fully involves the head of every study programme. The determination of operational costs is budgeted based on the need for the programme and the targets and indicators of the University. The study programme proposes a budget plan to faculty, and then it is met to determine what is approved based on priorities. After that, the faculty will submit a work plan adjusted to the university’s plan. The implementation of activities or programmes listed in the work plan can only be realized if the study programme has made a Term of Reference (TOR) of activities submitted to faculty one month before the date of activities. After the activity has already finished, the study programme is also required to make a written report and financial accountability submitted to faculty no later than two weeks after the activity takes place. The previous activity report is required to submit the TOR for the next activity. In addition to making work plans every year, the faculty

also evaluates them every three months. Changes to the initial work plan are still possible if, in its implementation, there is a change in the policy related to the programme that is not possible to implement or the budget changes.

4.3.1.1 Fund of Chemistry Study Programme

The operational fund of the Chemistry Study programme for the last five years is entirely consistent and stable. Some financial policies have changed during the pandemic and influenced some funding posts (Appendix 4.5.1 and Appendix 4.6.1). Thus, making the funding lower in 2021 but still adequate to support teaching and learning activities and other activities. Information on the funding programme for the last five years is present in Table 4.9

Table 4. 9 Funds of Chemistry Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 364.321.608	IDR 404.801.787	IDR 449.779.763	IDR 469.398.901	IDR 461.703.837
		EUR 22.224	EUR 24.693	EUR 27.437	EUR 28.633	EUR 28.164
	b. Academic Staff (salary, honorarium)	IDR 1.898.948.785	IDR 2.109.943.094	IDR 2.344.381.216	IDR 2.324.900.275	IDR 2.324.900.275
		EUR 115.836	EUR 128.707	EUR 143.007	EUR 141.819	EUR 141.819
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 22.878.987	IDR 25.421.096	IDR 28.245.662	IDR 16.675.769	IDR 17.902.565
		EUR 1.396	EUR 1.551	EUR 1.723	EUR 1.017	EUR 1.092
3	Research Funds	IDR 1.219.776.000	IDR 1.220.885.000	IDR 1.237.997.500	IDR 897.337.000	IDR 524.123.250
		EUR 74.406	EUR 74.474	EUR 75.518	EUR 54.738	EUR 31.972
4	Community service (PKM) Funds	IDR 34.215.000	IDR 34.210.000	IDR 34.500.000	IDR 61.142.000	IDR 73.500.000
		EUR 2.087	EUR 2.087	EUR 2.105	EUR 3.730	EUR 4.484
5	Human Resource Infestations Fund	IDR 23.770.562	IDR 26.411.736	IDR 29.346.373	IDR 19.924.425	IDR 19.076.213
		EUR 1.450	EUR 1.611	EUR 1.790	EUR 1.215	EUR 1.164
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**IDR 3.740.676.272**	**IDR 4.018.078.635**	**IDR 4.342.479.317**	**IDR 4.046.303.909**	**IDR 3.502.631.244**
		EUR 228.181	**EUR 245.103**	**EUR 264.891**	**EUR 246.825**	**EUR 213.661**

4.3.1.2 Fund of Chemistry Education Study Programme

Funding in the Chemistry Education Study programme is different from other programmes. Some financial policies have changed during the pandemic and influenced some funding posts (Appendix 4.5.2 and Appendix 4.6.2). Thus, it could make the funding lower. In Contrast, the condition didn't apply to this programme. Funding in 2020 even reaches the highest compared to the previous year before the pandemic. The impact of the pandemic in funding then occurred one year after in 2021, when funding was decreased. Nevertheless, the amount is adequate to support teaching, learning, and other programme activities. Information on the funding programme for the last five years is present in Table 4.10

Table 4. 10 Funds of Chemistry Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 676.597.272	IDR 751.774.747	IDR 835.305.275	IDR 857.449.983	IDR 857.449.983
		EUR 41.272	EUR 45.858	EUR 50.954	EUR 52.304	EUR 52.304
	b. Academic Staff (salary, honorarium)	IDR 1.898.948.785	IDR 2.109.943.094	IDR 2.344.381.216	IDR 2.324.900.275	IDR 2.324.900.275
		EUR 115.836	EUR 128.707	EUR 143.007	EUR 141.819	EUR 141.819
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
3	Research Funds	IDR1.415.000.000	IDR1.418.218.000	IDR 1.422.118.000	IDR 1.409.430.000	IDR 781.360.000
		EUR 86.315	EUR 86.511	EUR 86.749	EUR 85.975	EUR 47.663
4	Community service (PKM) Funds	IDR 64.448.000	IDR65.341.000	IDR 66.000.000	IDR 55.641.000	IDR 102.270.000
		EUR 3.931	EUR 3.986	EUR 4.026	EUR 3.394	EUR 6.238
5	Human Resource Infestations Fund	IDR 36.736.323	IDR 40.818.137	IDR 45.353.485	IDR 30.792.293	IDR 29.481.420
		EUR 2.241	EUR 2.490	EUR 2.767	EUR 1.878	EUR 1.798
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**Rp 4.402.850.573**	**IDR 4.402.850.573**	**IDR 4.731.784.081**	**IDR 5.097.256.979**	**IDR 5.119.368.167**
		EUR 268.574	**EUR 268.574**	**EUR 288.639**	**EUR 310.933**	**EUR 312.281**

4.3.1.3 Fund of Master's Degree of Chemistry Education Study Programme

The operational fund of the master's of Chemistry Study programme for the last five years has been relatively consistent and stable. Some financial policies have changed during the pandemic and influenced some funding posts (Appendix 4.5.3 and Appendix 4.6.3). Thus, the funding will be lower in 2020, and even 50% will fall from the previous year in 2021. However, the amount is still adequate to support teaching and learning activities and other activities. Information on the funding programme for the last five years is present in Table 4.11

Table 4. 11 Funds of Master's of Chemistry Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 260.229.720	IDR 289.144.133	IDR 321.271.259	IDR 329.788.455	IDR 329.788.455
		EUR 15.874	EUR 17.638	EUR 19.598	EUR 20.117	EUR 20.117
	b. Academic Staff (salary, honorarium)	IDR 146.072.983	IDR 162.303.315	IDR 180.337.017	IDR 178.838.483	IDR 178.838.483
		EUR 8.910	EUR 9.901	EUR 11.001	EUR 10.909	EUR 10.909
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 22.878.987	IDR 25.421.096	IDR 28.245.662	IDR 16.675.769	IDR 17.902.565
		EUR 1.396	EUR 1.551	EUR 1.723	EUR 1.017	EUR 1.092
3	Research Funds	IDR 1.440.000.000	IDR 1.450.500.000	IDR 1.469.364.000	IDR 1.187.862.000	IDR 401.050.000
		EUR 87.840	EUR 88.481	EUR 89.631	EUR 72.460	EUR 24.464
4	Community service (PKM) Funds	IDR 49.800.700	IDR 50.275.000	IDR 50.750.000	IDR 53.815.000	IDR 52.000.000
		EUR 3.038	EUR 3.067	EUR 3.096	EUR 3.283	EUR 3.172
5	Human Resource Infestation Fund	IDR 10.804.801	IDR 12.005.334	IDR 13.339.260	IDR 8.949.379	IDR 8.671.006
		EUR 659	EUR 732	EUR 814	EUR 546	EUR 529
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**IDR 2.106.552.521**	**IDR 2.186.054.801**	**IDR 2.281.536.001**	**IDR 2.032.854.624**	**IDR 1.069.675.613**
		EUR 128.500	**EUR 133.349**	**EUR 139.174**	**EUR 124.004**	**EUR 65.250**

4.3.1.4 Fund of Biology Study Programme

The operational fund of the Biology Study programme for the last five years has been consistent and stable. In 2021 the amount of funds bit decreased due to pandemic impact in 2021 (Appendix 4.5.4 and Appendix 4.6.4). However, the amount is still adequate to support teaching and learning activities and other activities. Information on the funding programme for the last five years is present in Table 4.12

Table 4. 12 Funds of Biology Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 572.505.384	IDR 636.117.094	IDR 706.796.771	IDR 725.534.601	IDR 725.534.601
		EUR 34.923	EUR 38.803	EUR 43.115	EUR 44.258	EUR 44.258
	b. Academic Staff (salary, honorarium)	IDR 1.898.948.785	IDR 2.109.943.094	IDR 2.344.381.216	IDR2.324.900.275	IDR 2.324.900.275
		EUR 115.836	EUR 128.707	EUR 143.007	EUR 141.819	EUR 141.819
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 22.878.987	IDR 25.421.096	IDR 28.245.662	IDR 16.675.769	IDR 17.902.565
		EUR 1.396	EUR 1.551	EUR 1.723	EUR 1.017	EUR 1.092
3	Research Funds	IDR1.798.167.000	IDR1.812.000.300	IDR 1.826.389.236	IDR1.086.732.000	IDR 960.050.000
		EUR 109.688	EUR 110.532	EUR 111.410	EUR 66.291	EUR 58.563
4	Community service (PKM) Funds	IDR118.700.000	IDR120.520.000	IDR 122.000.000	IDR 128.525.000	IDR 135.500.000
		EUR 7.241	EUR 7.352	EUR 7.442	EUR 7.840	EUR 8.266
5	Human Resource Infestations Fund	IDR 36.736.323	IDR 40.818.137	IDR 45.353.485	IDR 30.427.888	IDR 29.481.420
		EUR 2.241	EUR 2.490	EUR 2.767	EUR 1.856	EUR 1.798
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**Rp 4.624.701.809**	**IDR 4.624.701.809**	**IDR 4.941.225.643**	**IDR 5.291.395.173**	**IDR 4.569.721.071**
		EUR 282.107	**EUR 282.107**	**EUR 301.415**	**EUR 322.775**	**EUR 278.753**

4.3.1.5 Fund of Biology Education Study Programme

Funding of Biology education programme has suffered a decrease for the last two years. The cause would be the pandemic impact on the funding policy (Appendix 4.5.5 and Appendix 4.6.5). However, the amount is still adequate to support teaching and learning activities and other activities. Information on the funding programme for the last five years is present in Table 4.13

Table 4. 13 Funds of Biology Education Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 572.505.384	IDR 636.117.094	IDR 706.796.771	IDR 737.626.844	IDR 725.534.601
		EUR 34.923	EUR 38.803	EUR 43.115	EUR 44.995	EUR 44.258
	b. Academic Staff (salary, honorarium)	IDR 1.898.948.785	IDR 2.109.943.094	IDR 2.344.381.216	IDR 2.324.900.275	IDR 2.324.900.275
		EUR 115.836	EUR 128.707	EUR 143.007	EUR 141.819	EUR 141.819
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
3	Research Funds	IDR330.500.000	IDR325.700.000	IDR 326.525.000	IDR 130.000.000	IDR 221.050.000
		EUR 20.161	EUR 19.868	EUR 19.918	EUR 7.930	EUR 13.484
4	Community service (PKM) Funds	IDR55.000.000	IDR57.300.000	IDR 58.750.000	IDR 72.380.000	IDR 87.600.000
		EUR 3.355	EUR 3.495	EUR 3.584	EUR 4.415	EUR 5.344
5	Human Resource Infestations Fund	IDR 36.736.323	IDR 40.818.137	IDR 45.353.485	IDR 30.427.888	IDR 29.481.420
		EUR 2.241	EUR 2.490	EUR 2.767	EUR 1.856	EUR 1.798
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**IDR 3.204.810.685**	**IDR 3.515.567.427**	**IDR 3.865.905.475**	**IDR 3.736.489.622**	**IDR 3.516.664.169**
		EUR 195.493	**EUR 214.450**	**EUR 235.820**	**EUR 227.926**	**EUR 214.517**

4.3.1.6 Fund of master's degree of Biology Education Study Programme

Operational fund of master's degree of Biology Education programme for the last five years shown consistency and stability. Moreover, it is adequate to support teaching and learning activities and other activities. Some financial policies have changed during the pandemic and influenced some funding posts (Appendix 4.5.6 and Appendix 4.6.6). Student operational funds, human resources infestation fund, and infrastructure operational fund decreased in 2020. Fortunately, the rest of the post increase makes the total funding in this year still sufficient. Information on the funding programme for the last five years is present in Table 4.14.

Table 4. 14 Funds of Master's of Biology Study Programme

No.	Category of Usage	Department Funds - IDR (Euro)				
		2017	2018	2019	2020	2021
1	Education Operational Fund					
	a. Lecturer (salary, honorarium)	IDR 312.275.664	IDR 346.972.960	IDR 385.525.511	IDR 395.746.146	IDR 395.746.146
		EUR 19.049	EUR 21.165	EUR 23.517	EUR 24.141	EUR 24.141
	b. Academic Staff (salary, honorarium)	IDR 146.072.983	IDR 162.303.315	IDR 180.337.017	IDR 178.838.483	IDR 178.838.483
		EUR 8.910	EUR 9.901	EUR 11.001	EUR 10.909	EUR 10.909
	c. Learning Activity (Materials and Consumable Equipment)	IDR 134.354.862	IDR 149.283.180	IDR 165.870.200	IDR 184.229.077	IDR 46.672.769
		EUR 8.196	EUR 9.106	EUR 10.118	EUR 11.238	EUR 2.847
2	Student Operational Fund (cognitive, specialty, ability, and wealth)	IDR 22.878.987	IDR 25.421.096	IDR 28.245.662	IDR 16.675.769	IDR 17.902.565
		EUR 1.396	EUR 1.551	EUR 1.723	EUR 1.017	EUR 1.092
3	Research Funds	IDR 356.900.000	IDR 375.700.000	IDR 376.200.500	IDR 388.000.000	IDR 630.820.000
		EUR 21.771	EUR 22.918	EUR 22.948	EUR 23.668	EUR 38.480
4	Community service (PKM) Funds	IDR 40.250.000,00	IDR 40.330.000,00	IDR 40.750.000,00	IDR 59.130.000,00	IDR 40.600.000,00
		EUR 2.455	EUR 2.460	EUR 2.486	EUR 3.607	EUR 2.477
5	Human Resource Infestations Fund	IDR 12.965.761	IDR 14.406.401	IDR 16.007.112	IDR 10.739.254	IDR 10.405.207
		EUR 791	EUR 879	EUR 976	EUR 655	EUR 635
6	Facility Infestations Fund	IDR 28.909.274	IDR 32.121.415	IDR 35.690.462	IDR 58.040.231	IDR 17.902.565
		EUR 1.763	EUR 1.959	EUR 2.177	EUR 3.540	EUR 1.092
7	Infrastructure Infestation Fund	IDR 13.501.194	IDR 15.001.327	IDR 16.668.141	IDR 14.656.231	IDR 16.849.769
		EUR 824	EUR 915	EUR 1.017	EUR 894	EUR 1.028
Total		**IDR 1.068.108.725**	**IDR 1.161.539.695**	**IDR 1.245.294.605**	**IDR 1.306.055.191**	**IDR 1.355.737.505**
		EUR 65.155	**EUR 70.854**	**EUR 75.963**	**EUR 79.669**	**EUR 82.700**

The fund service is evaluated, and the satisfaction survey result is 3.4 out of 4 scales as the highest average points for working allowance services to the lecturers. The survey results of the accounting service are presented in Figure 4.12 below

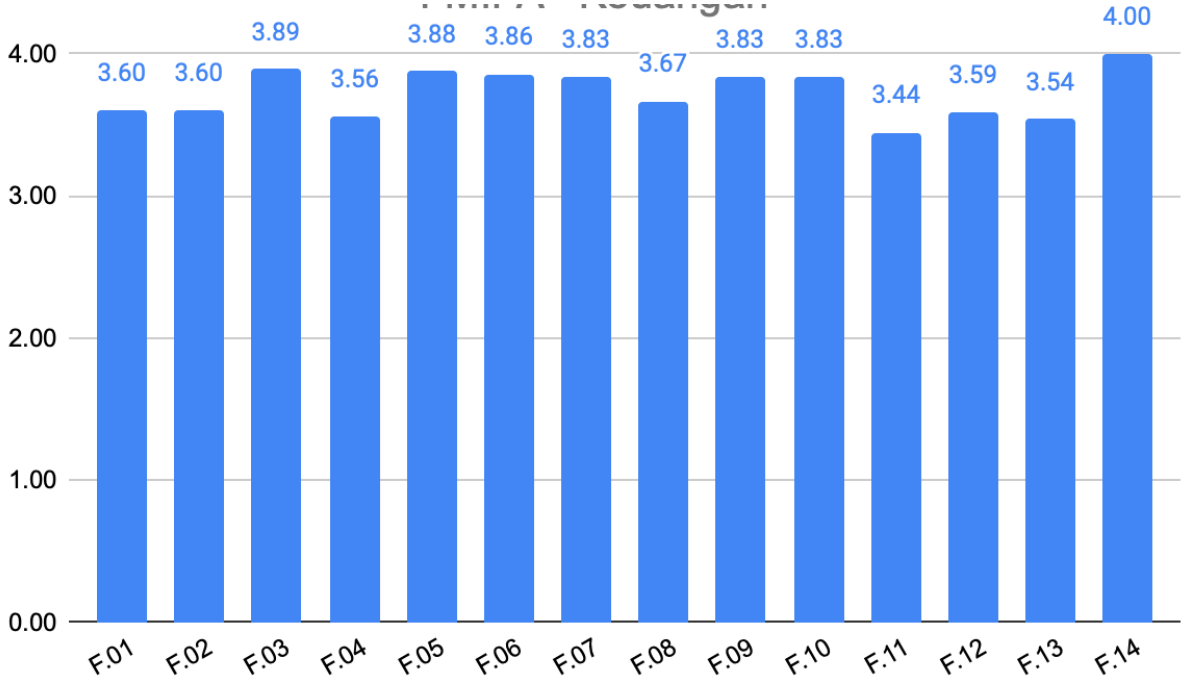

Figure 4. 12 Survey Results of Accounting Services Satisfaction

(F.01 Faculty Stock Money/Funding, F.02 Fund Disbursement, F.03 Direct Funding, F.04 Further Study Funding, F.05 Partnership Fundings, F.06 Partnerships, F.07 Building, F.08 Business Trip Funding, F.09 Business Meeting, F.10 Accounting Report, F.11 Regular Payroll F.12 Main Funding for Study (UKT), F13. Remuneration of Lecturers, F14. Staff Working Allowance (Tukin)

4.3.2 Equipment

FMIPA UNJ has excellent facilities, such as ten floors with sufficient equipment. Many rooms are available in the FMIPA building, including classrooms, laboratories, lecturer's room, study programme coordinator's room, deanery room, students' board organization (BEM) room, academic service office, finance office, and general equipment affair office, and library. All classrooms in FMIPA are provided with projectors and whiteboards. The classroom is centred on building general courses for general courses, not in Hasjim Asjari Building. Data of FMIPA rooms can be seen in Table 4.15 as follows:

Table 4. 15 Data of FMIPA UNJ Rooms

No	Type of Room	Total of Room	Area (m^2)	Location
1	Classroom	18	1,163.11	Hasjim Asj'Arie Building 1st – 10th floor
		8	620.00	Dewi Sartika Building (2 floors)
		3	192.00	EX BAAK Building (1st – 3rd floor)
2	Office Room/ Lecturer Room/ Staff Room	33	1,104.56	Hasjim Asj'Arie Building 1st – 10th floor
		4	238.50	Dewi Sartika Building (2 floors)
		2	32.00	EX BAAK Building (1st – 3rd floor)
		26	381.25	C Building, Campus B (3 floors)
3	Thesis Defense Room/ Consultation Room/ Discussion Room	6	265.29	Hasjim Asj'Arie Building 6th floor
		1	40.00	Dewi Sartika Building 3rd floor
4	Laboratory/ Production Room/ Practicum Room	51	753.42	Hasjim Asj'Arie Building 9th – 10th floor
		7	418.50	Dewi Sartika Building
		4	208.00	EX BAAK Building (1st – 3rd)
		13	955.83	C Building, Campus B
		1	49.60	Green House
5	Rest Room/ Toilet	30	557.73	Hasjim Asj'Arie Building 1st – 10th
		8	98.32	Dewi Sartika Building (2 floors)
		3	33.60	EX BAAK Building (1st – 3rd)
		3	50.63	C Building, Campus B (3 floors)

No	Type of Room	Total of Room	Area (m^2)	Location
6	Warehouse/ Archive Room	5	80.96	Hasjim Asj'Arie Building 1st – 10th building
		1	16.00	EX BAAK Building (1st – 3rd floor)
		3	31.9	C Building, Campus B (3 floors)
7	Library	1	107.10	Hasjim Asj'Arie Building 1st floor
8	Student Board Organization Room	1	90.33	Hasjim Asj'Arie Building 3rd
9	Mushalla (Praying Room)	1	7.84	EX BAAK Building 3rd floor
10	Kitchen Room/ Eating Room/ Smoking Room/ Lactation Room. Pantry Room/ Janitor	16	118.63	Hasjim Asj'Arie Building 1st – 10th
		2	14.66	Dewi Sartika Building (2 Floors)
		4	94.74	C Building, Campus B
11	Server Room/ Operator Room/ Control Room	1	15.31	Hasjim Asj'Arie Building 1st floor
		2	27.16	Dewi Sartika Building
12	Technician Room/ Programme Room	1	7.90	Hasjim Asj'Arie Building 1st floor
13	DAK	1	896.88	Hasjim Asj'Arie Building

Besides the classroom, lecturer's room and service room, there are laboratory rooms. Every laboratory activity or research is held in the laboratory room, categorized as a learning laboratory and research laboratory. Each laboratory is equipped with tools required to accommodate the practicum activities and research conducted by the students and lecturers. The equipment is integrated to accommodate the lecturers' research. (https://www.youtube.com/watch?v=wDUDgl4AiXI) They are provided based on learning and research needs. The faculty required but not provided tools are borrowed by collaborating with their partners based on the agreement (Appendix 4.7). Data of laboratory rooms are shown in Table 4.16 below:

Table 4. 16 Data of Laboratory Rooms of FMIPA UNJ

No	Name of Laboratory	Area (m^2)	Location
1	Physical Chemistry Laboratory	96.00	GHA 7th floor
2	Inorganic Chemistry Laboratory	96.00	GHA 7th floor
3	Organic Chemistry and Biochemistry Laboratory	96.00	GHA 8th floor
4	Analytical – Environmental Chemistry Laboratory	96.00	GHA 8th floor
5	Instrumental Laboratory	84	BB.301 and BB.302
6	Organic Chemistry Research Laboratory	69.79	Ex-BAAK Building C.302
7	Inorganic Chemistry Research Laboratory	69.79	Ex-BAAK Building C.302 dan C.303
8	Basic of Chemistry Joint Laboratory	96.00	GHA 7th floor
9	General Biology Laboratory		EX-BAAK Building 1st floor
10	Biochemistry Laboratory	48.00	EX-BAAK Building 101
11	Molecular Laboratory	32.00	EX-BAAK Building 102
12	Zoology Laboratory	64.00	EX-BAAK Building 103
13	Structure and Growth of Plant Laboratory	71.40	GHA 8th floor
14	Physiology of Plant Laboratory	71.40	GHA 8th floor
15	Basic Ecology Laboratory	71.40	GHA 8th floor
16	Zoology Laboratory	71.40	GHA 9th floor
17	Structure and Growth of Animal Laboratory	71.40	GHA 9th floor
18	Physiology of Animal Laboratory	71.40	GHA 9th floor
19	Biochemistry and Genetics Laboratory	71.40	GHA 9th floor
20	Microbiology Laboratory	71.40	GHA 9th floor
21	Plant Tissue Culture Laboratory	35.70	GHA 9th floor
22	Instrumental Physics Laboratory	71.40	GHA 10th floor
23	Geophysical Laboratory	71.40	GHA 10th floor

No	Name of Laboratory	Area (m^2)	Location
24	Modern Physics Laboratory	71.40	GHA 10th floor
25	Material Physics Laboratory	12.39	GHA 10th floor
26	Hard Material Laboratory	23.67	GHA 10th floor
27	Soft Material Laboratory	23.11	GHA 10th floor
28	Digital Media Laboratory	71.40	GHA 10th floor
29	Basic Electronical Physics Laboratory	71.40	GHA 10th floor
30	Instrumentation Laboratory	64.00	Ex.BAAK Building 301
32	Media of Physics Learning Laboratory	100	GHA
32	Media of Non-IT Learning Laboratory	100	GHA 7th floor
33	Media of IT Learning Laboratory	100	GHA 7th floor
34	Physics-Chemistry Joint Computer Laboratory	22.40	GHA 8th floor

An observation of queue time to use the equipment is completed to acquire the laboratories needs of the tool. The tools with the longest queue time are striven to set in more than one unit so that it is expected to fulfil the students' needs.

All parts of the building in FMIPA have been facilitated with K3 standard of tools (tools standard operational procedure and lab tools inventory). Every floor is provided with a fire extinguisher and stairs to get a more straightforward evacuation process in any urgent situation. The laboratories are also equipped with standard security procedures. Before entering the laboratories, the students must read the procedures of Health and Safety Work (K3). While entering the laboratories, both the students and lecturers must wear laboratories suits and footwear. The practicum activity or research related to any dangerous chemicals will be held with special procedures, like using an acid room or acid ventilation to reduce the dangerous gas exposures and the toxic steam and gas exposures. In addition, all parts of the laboratories have been set based on the standard of security.

Facility development is completed based on the evaluation of satisfactory results. Satisfaction results towards the facilities and infrastructures from the students, lecturers, and academic staff are evaluated using the satisfaction form. Based on the survey data, the average of students and academic staff satisfaction towards the facility is 3.4. The highest point of satisfaction is for learning equipment preparation which is 3.73. Information of satisfaction results for the facility is presented in Figure 4.13 below:

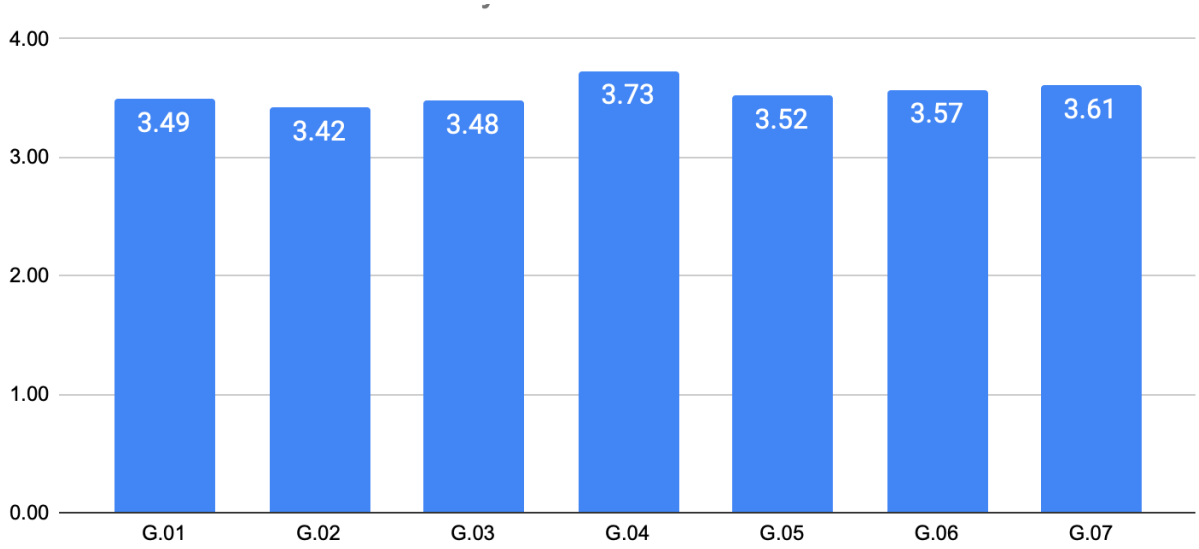

Figure 4. 13 Average Point of Satisfaction Result for Facilities and Infrastructures

(G.01 Vehicles, G.02 Room Rental, G.03 Goods, G.04 Learning Support Equipment, G.05 Building, G.06 Hygiene, G.07 Rental Service)

CRITERIA 5: TRANSPARENCY AND DOCUMENTATION

5.1 Module Description

University as the sources of educated people requires assessing its graduates' target of achievements whether their abilities equal with the ability (learning achievement) formulated in KKNI (National Framework of Qualification) levels. Laws No.12 the Year 2012 article 35 verse 2 stated that the Curriculum of Higher Education is developed by each university, referring to the National Standard of Higher Education (SNPT) for every study programme. The curriculum is defined as a set of plans and regulations about aims, content and materials of learning, and standard procedures to reach the university goals.

The curriculum is assessed and developed regularly as a response to the advancement of science, technology, and art (IPTEKS) or scientific vision, social needs, and stakeholder needs to be linked and matched with the era of advancement and industrial's needs. The curriculum consists of graduate profiles, PEO and PLO, which have to be accomplished by the study programme. The study programme organizes a structure of the programme in the form of course reviews and course distributions. The description of the course is described in the module description. A course has learning goals (CPMK) in line with PLO and PEO. CMPK is explained in semester learning plans (RPS). RPS is a learning process plan designed for a one-semester learning activity to achieve the graduate learning outputs (PLO) distributed in every course. The RPS is decided or developed independently or collectively in course review as guidance of learning activity for the lecturers and students. RPS document consists of description about: name, of course, credits, total and time of the meeting, course lecturer, course description, course requirement, PLO of study programme distributed in the courses, learning goals of courses (CPMK), learning methods, course topics, learning steps, course regulations, assignments and exams, assessment instruments, assessment criteria, references, and lesson plan date changes.

Characteristics of learning courses in FMIPA include theories, laboratory practice, field study, industrial practice, teaching practice, and seminars. The learning steps in the lesson plan (RPS) explain the various characteristics of the learning course. The curriculum can be accessed in https://sikur.unj.ac.id/ and Academic Guidance Book (Appendix 5.1).

5.2 Diploma and Diploma Supplement

FMIPA gives bachelor and master's graduates a diploma certificate and supplement. A diploma certificate is a certificate or official document given by the university after students finish their studies, which the Rector signs. Diploma supplements consist of a graduate certificate, score transcripts and certificate accompanying diploma (SKPI-Surat Keterangan Pendamping Ijazah) (Appendix 5.2). A graduate certificate is a statement of completion at the university level related to the study programme. The score transcript is a letter of collection of grades for all courses starting from the first semester until the last semester that has been taken during lectures along with GPA, which the Dean signs. GPA or Grade Point Average is the final accumulation of the total value obtained by students while studying in college, which is used as a benchmark for passing grades. SKPI is an official statement issued by the university of academic achievements or graduate qualifications through knowledge internalization, attitude, skills, competencies, and working experiences. SKPI also records the students' learning activities during their studies http://skpi.unj.ac.id/ SKPI explains the

competency standard of graduates stated in Laws No.12 the Year 2012 about Higher Education article 52 verse 3 and article 54 verse 1.

The student who gets the diploma certificate, score transcripts, and SKPI has completed a minimum of 144 credits or equal to 216 ECTS and has passed all the compulsory courses for the Bachelor study programme. Meanwhile, the Master program have to complete 44 credits or equal to 114,4 ECTS and have passed all the compulsory courses for the Master's study programme.

The certificate and score transcripts are managed in Decree of Minister of Research, Technology, and Higher Education No.5 the Year 2018 about Diploma Certificate, Competency Certificate, Profession Certificate, Degree and its writing rules in Higher Education. Rectorate Decree of Diploma Certificate Issuance Authority and SKPI has been completed by the university and signed by Rector and Dean as stated in Decree of Minister of Education and Culture No. 81 the Year 2014.

Students of Bachelor's Programme is graduate when they have completed all the study courses and meet the learning goals targeted by the study programme with Grade Point Average (GPA) more than or as exact as 2.00 (two points zero). According to Regulation of Minister of Education and Culture of Indonesian Republic No.3 the Year 2020, the student's success in completing a course is stated in students qualification with the letter A equals with number 4 (four) categorized as 'excellent'; letter B equals with number 3 (three) categorized as 'good'; letter C equals with number 2 (two) categorized as 'enough'; letter D equals with number 1 (one) categorized as 'insufficient', and letter E equals with number 0 (zero) categorized as very insufficient. The students will graduate with a satisfying predicate if they have GPA from 2.75 to 3.00. The students will graduate with a very satisfying predicate if they have GPA from 3.01 to 3.50, and they will have a Claude predicate if their GPA is more than 3.50. If their GPA is under 2.76, they will not have any predicate.

Meanwhile, the students of Master's degree can have a satisfying predicate if they have a GPA from 3.00 to 3.50. They can have a very satisfying predicate if their GPA is 3.51 to 3.75. The students will have a cumlaude predicate if their GPA exceeds 3.75.

5.3 Relevant Rules

Regulation of Minister of Research, Technology and Higher Education No.42 the Year 2018 has managed UNJ Statute. UNJ Statute contains some regulations and policies, including the right and obligations of academicians' society at UNJ. It is fundamental guidance of activity convention that is utilized as a reference to plan and develop the programme and functional activity convention based on the purpose of the university. An Academic Guidance Book (BPA) is published to guide the academic implementation in Bachelor and Master's study programmes. It has been relevant with the Minister of Education and Culture policy about Independent Learning/Independent Campus.

The students can get information related to the new recruitment in UNJ through https://www.unj.ac.id/en/. The recruitment track of the Bachelor's programme is done by national selection tests of state university entrance (SNMPTN), collective selection of state university entrance (SBMPTN), and independent selection (PENMABA). An independent selection test holds the recruitment track of the Master's programme. After the candidate of students are accepted, they are required to do administrative registration by paying UKT (tuition fee) every semester, so they will get student identity number (NIM) and user identity to access the academic information system (SIAKAD UNJ) and the Learning Management System (UNJ LMS). Then, UNJ will facilitate the new students with debriefing activity (Introduction of Campus Life for New Student/PKKMB). When the activity starts, the students can follow all the event rundowns from the university to study programme PKKMB. By having PKKMB, the students will know their rights and obligation as UNJ students. They will get an almamater suit, student ID card and BPA. The study programme will also offer an Academic

Advisor (PA) whom the faculty approve to become the students' companion during their study. Then, the students should do an academic registration by filling out the course plan card (KRS) based on each study programme curriculum via SIAKAD.

The UNJ students with active status have some rights to 1) get education and training in study programme; 2) give their opinion without disturbing others and public orders; 3) get information about their academic achievement through study report card (KHS); 4) get supervision from their academic advisor in their period of study, research, and community service; 5) get supervision from their academic advisor while completing their final projects and scientific paper as a reference from the study programme which the faculty determine. Next, the students have a right to get good service in the academic, admission, student's affairs section. In the academic section, they have the right to apply and get scholarships with terms and conditions.

UNJ also provides facilities for the students to support their academic activities, such as technical service unit (UPT) of library, language centre, internship, counselling, health care clinic, sports facilities, praying facilities, dormitory, and canteen. The students have the right to join any students organization in UNJ through OPMAWA and ORMAWA. Every service for academic civitas is evaluated regularly by SPMI using the survey instrument of Society Satisfaction in the link http://spm.unj.ac.id/?page_id=8179. The society that is being surveyed is lecturers and students. It covers satisfaction in academic services, facility and infrastructure, and supporting units. The results stated by lecturers are in Figure 5.1

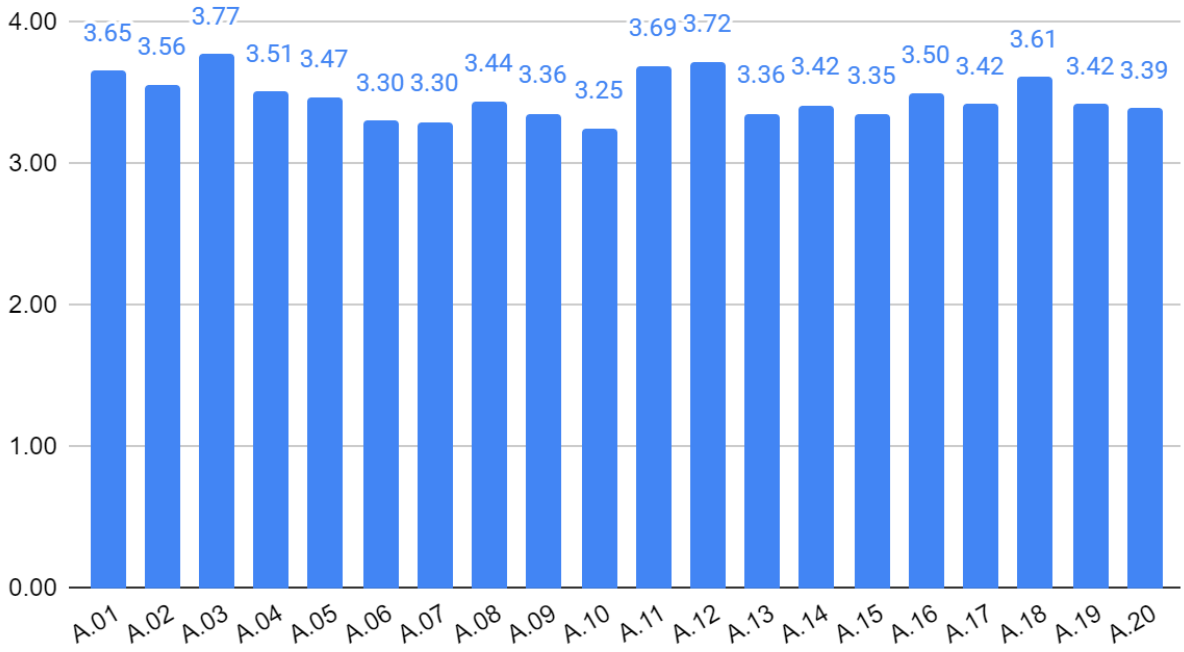

Figure 5. 1 Survey Results towards Academic Service Satisfaction

(A01: Selection of Student Service; A02: Study Plan Card (KRS) Filling and Revision; A03: Learning Service; A04: Score Input by Lecturers; A05: Field Study Practice (PPL) Service; A07: Field Work Practice (PKL) Service; A08: Internship/MBKM; A09: Community Service Programme (KKN); A10 Students Leave Service; A11: Mid-term and Final-term Service; A12: Student's Learning Result (KHS) Service; A13: Thesis Advisory Service; A14: Thesis Registration and Thesis Proposal Defense Service; A15: Thesis Defense Registration Service; A16: Judicium Service; A17: Graduation Service; A18: Legalization Service; A19: Career Advisory Service; A20 SKPI Service

The survey results for academic service satisfaction shows that all the services from A01 to A20 are in the satisfied-very satisfying level. The results are presented in Figure 5.2.

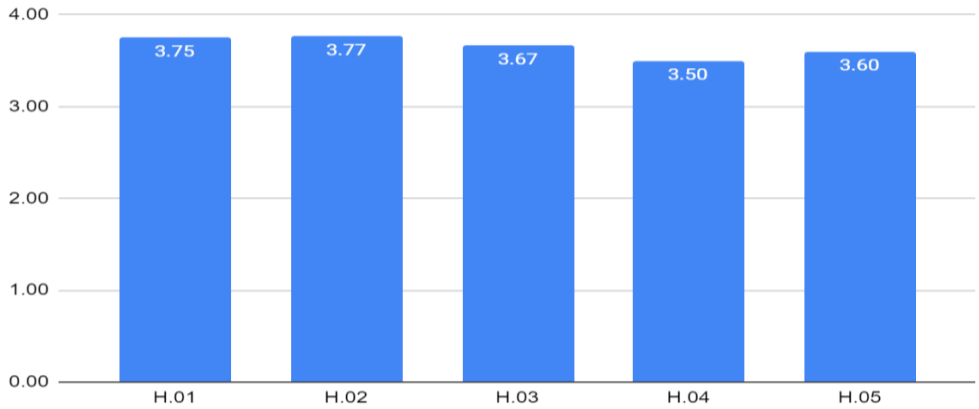

Figure 5. 2 Survey Results of Satisfaction for Supporting Service Unit in UNJ (H01: Unit Library Service Unit; H02: Polyclinic Service Unit; H03: Language Service Unit; H04: Unit Computer and Information Technology (Putikom) Service Unit; H05: Counseling Advisory Service Unit)

The survey result shows that the satisfaction level of users towards supporting service unit is in satisfied-very satisfying level for all service categories from H01 to H05.

Evaluation of graduates also has been conducted through a tracer study. The details are shown in Criteria 6. The evaluations consist of: a period of study, GPA, gap time to get the job, the students' percentages of having the job matched with their study profile. The graduates' evaluation data in the last three years, as shown in Table 5.1.

Table 5. 1 Data of graduate evaluation in the last two years

Aspect	The Academic Year 2019-2020				The Academic Year 2020-2021			
	Odd Semester		Even Semester		Odd Semester		Even Semester	
	Bachelor	Master	Bachelor	Master	Bachelor	Master	Bachelor	Master
Number of Graduates	135	30	125	45	203	15	191	24
Average Period of Study	9 semester	6 Semester	8 semester	4 semester	9.2 semester	6.9 semester	9.2 semester	5.8 semester
The Lowest GPA	2,9	3,4	2,84	3,63	2,33	3,38	2.93	3.58
The Highest GPA	3,76	3,9	3,78	3,96	3,78	3,84	3.80	3.95
Average of Grade Point	3,37	3,68	3,41	3,74	3,34	3,65	3.45	3.73

Besides their rights, the students also have to complete their obligations, such as following the lecturing activities, practices, and other academic activities based on the terms and conditions. The students have to attend 80% of classroom activity by upholding and keeping academic integrity. The students also have to preserve the academic situation at the campus, maintain the good name of their alma mater, and maintain their integrity. The

students also need to preserve the facilities in UNJ. They do not misuse it for individual or collective purposes irrelevant to any academic and student affairs activity.

Furthermore, the students have to oblige all the regulations in UNJ. The students also should have exemplary achievements in academic and non-academic sections. The students with outstanding achievements will be honoured by UNJ with specific terms and conditions.

CRITERIA 6: QUALITY MANAGEMENT: QUALITY ASSESSMENT AND DEVELOPMENT

The Faculty of Mathematics and Natural Sciences applies quality assurance to maintain the high level of education and research quality for bachelor and master programs based on regulation Number 12 of 2012 on Higher Education and Government Regulation Number 44 of 2015 on the National Education Standards. Generally, quality assurance is aimed at the quality supervision and improvement of academic and non-academic programs. The academic program is education and research, while the non-academic program is finance, management, assets, and human resource. Therefore, all programs meet the standard and actualize the program's transparency and accountability to the public and stakeholders. The University Quality Assurance Unit handles internal quality assurance. Meanwhile, an institution outside of the university monitors external quality assurance. The policy of quality assurance in UNJ is attached in Appendix 6.1.

The Quality Assurance Unit (QAU) at Universitas Negeri Jakarta consists of QAU at the university level or Satuan Penjaminan Mutu (SPM), at faculty level or Gugus Penjaminan Mutu (GPjM), and at the study program level or Tim Penjaminan Mutu (TPjM). This quality assurance unit is formed based on the Rector Decree Number 844/UN39/KP.08.01/2021. QAU at the university level coordinates and set the QA rule. Meanwhile, the QAU at the faculty level coordinates the TPjM and analyses the survey data. Simultaneously, the QAU at the study program is responsible for quality assurance implementation in the study programs. The following figure shows the quality assurance organization in Figure 6.1 below.

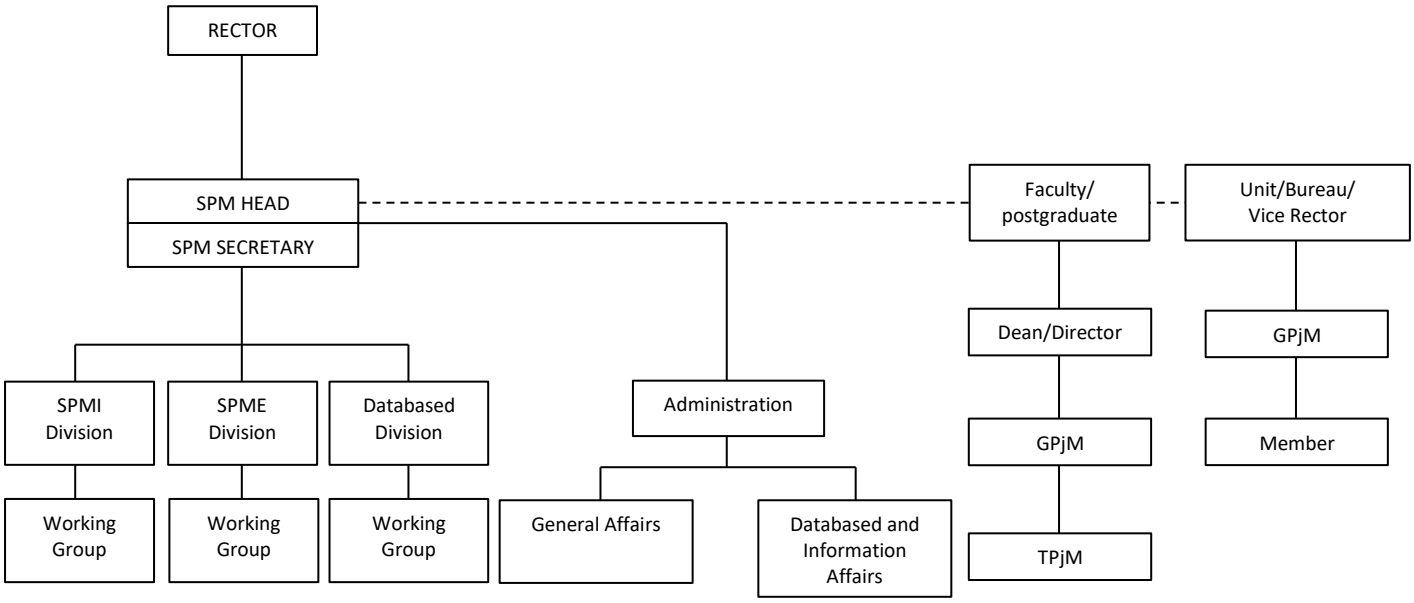

Figure 6. 1 The organization structure of Quality Assurance System at Universitas Negeri Jakarta

6.1 Internal Quality Assurance System

The academic program quality is monitored through an Internal Quality Assurance System or Standard Penjaminan Mutu Internal (SPMI), which consists of monitoring and internal quality audit of education and research. The monitoring supervises the university's learning and teaching process, obtained at the semester's beginning, middle, and end. The monitoring result suggests improving the university learning and teaching activity. The audit is a system to supervise the quality of education and research. The end of the year ensures that the program has been processed with the proper procedures and the program outputs have met the standards. Through this audit result, the university can determine some improvements.

Besides audit and monitoring, the quality assurance unit also gains information from the students every year. The students sign the University Student Survey to express opinions about their degree program. The survey results give current and prospective students an impression of how students view their programs. The survey result is a source of information for improvement. Based on the audits, monitoring's and student survey results, the quality assurance unit analyses the academic program's problem. Afterwards, they give the insight to improve the quality standard in strategic plans, policy revisions, or goal adjustments.

The survey results are published periodically on the website and are accessible to the public. In addition, documents on the quality standard assurance policy at the Faculty of Mathematics and Natural Sciences Universitas Negeri Jakarta are included in the Internal Quality Assurance System documents downloaded from the website. Stakeholders' involvement is also welcome in constructing the strategic plan of Universitas Negeri Jakarta so that the plan proposed can accommodate all parties

Faculty of Mathematics and Natural Sciences of Universitas Negeri Jakarta implements the Internal Quality Assurance System through Implementation Disposal of Improvement Control Evaluation (PPEPP) model, which consists of five steps: set the system and rule, apply the system, evaluate the system, give a recommendation, and improve the system. Through the PPEPP model, the achievement will be monitored, evaluated, and developed periodically to ensure quality improvement. The PPEPP result is reported to the dean, study program coordinator, students, public, and stakeholders. The Dean will then determine the steps or policy to improve the academic quality based on the report.

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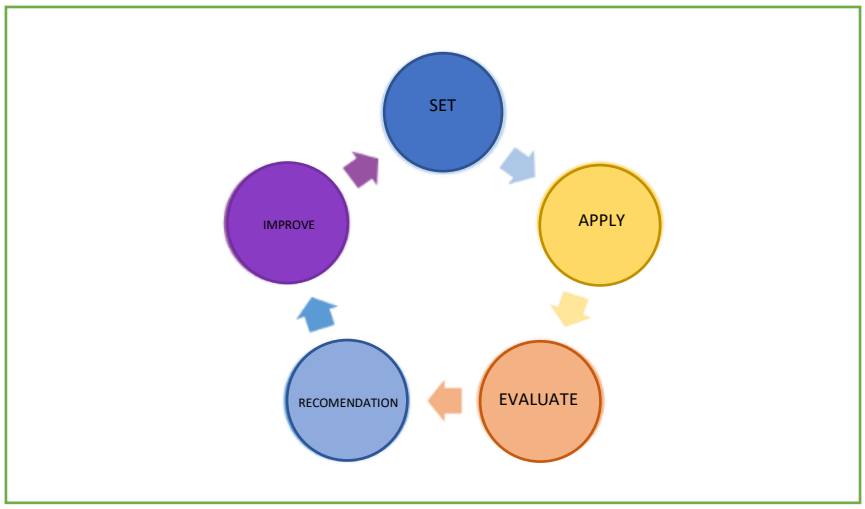


Figure 6. 2 The cycles of the Internal Quality Assurance System at Universitas Negeri Jakarta

6.2 Quality Assurance System

Besides SPMI, the Faculty of Mathematics and Natural Sciences also applies an External Quality Assurance System or Sistem Penjaminan Mutu Eksternal (SPME) through the external institution. The External Quality Assurance System is a systematic eligibility assessment activity and the higher education institution or university conducted by an independent institution or an international accreditation body outside the higher education institution or university recognized by the government, to supervise the higher education institution or university implementation on behalf of the community, as a form of public accountability. Through an accreditation process, the External Quality Assurance System is expected to recognize the quality culture that has been formed through the Internal Quality Assurance System. The External Quality Assurance System implementation at the Postgraduate Program of Jakarta State University is based on Law Number 12 of 2012 on Higher Education.

The National Accreditation Institution supervises university and study program accreditation in Indonesia. The accreditation is a quality label for a university or study program from the National Accreditation Institution of the Ministry of Education and Culture. In this accreditation, the university is evaluated and receives a positive assessment by the National Accreditation Institution. The accreditation is conducted every five years. In 2021, 5 study programs at the Faculty of Mathematics and Natural Sciences had accredited "A, "and 9 study programs were accredited "B."

6.2.1. Academic Integrity

Quality assurance ensures the rule of academic integrity is implemented in academic life. Besides internal and external quality assurance systems, this unit also has to ensure that the student and academic staff comprehends academic integrity. Academic integrity means not cheating, plagiarizing or engaging in other forms of academic dishonesty. In academic integrity, plagiarism and cheating are unacceptable.

Furthermore, academic staff and students can find academic integrity regulation in the ethical codebook. The faculty also conducts an academic integrity survey to measure the student comprehension of academic integrity. Later on, academic integrity survey results enhance academic integrity quality at Universitas Negeri Jakarta. The academic integrity survey's data was obtained from 822 respondents. The respondents are students at the Faculty of Mathematics and Natural Science, Universitas Negeri Jakarta, which consist 15% bachelor of physics, 12% bachelor's in chemistry, 6% bachelor's in biology, 8% bachelor's in mathematics, 4% bachelor's in physical education, 8% bachelor's in computer, 6% bachelor's in statistics, 10% bachelor's in chemistry education, 11% bachelor's in biology, 9% bachelor's in mathematics education, 2% master's in physics education, 3% master's in chemistry education, 3% master's in biology education, and 3% master's in mathematics education. The survey is available at the following address https://fmipa.unj.ac.id/mipabaru/form-integritas-akademik/.

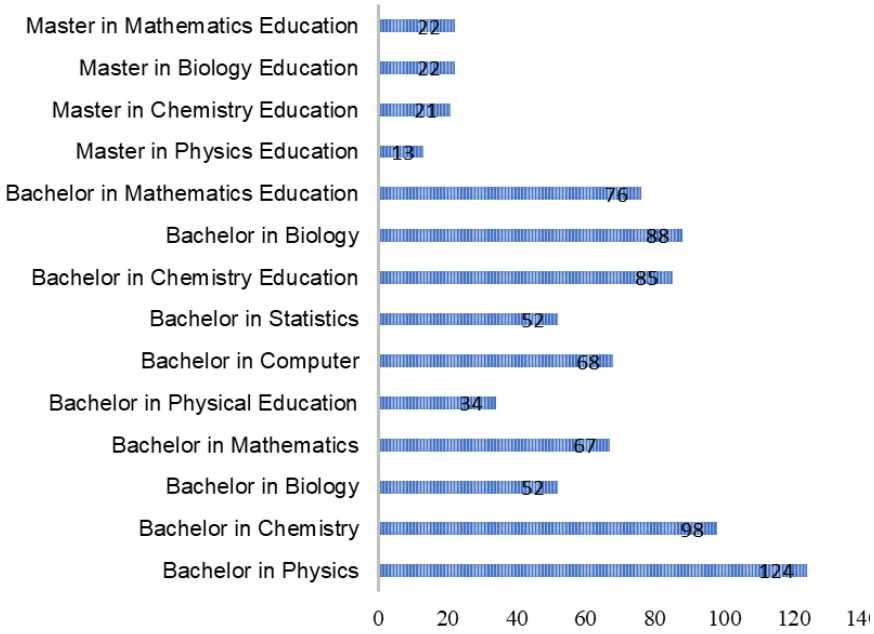


Figure 6. 3 The respondent of the academic integrity survey

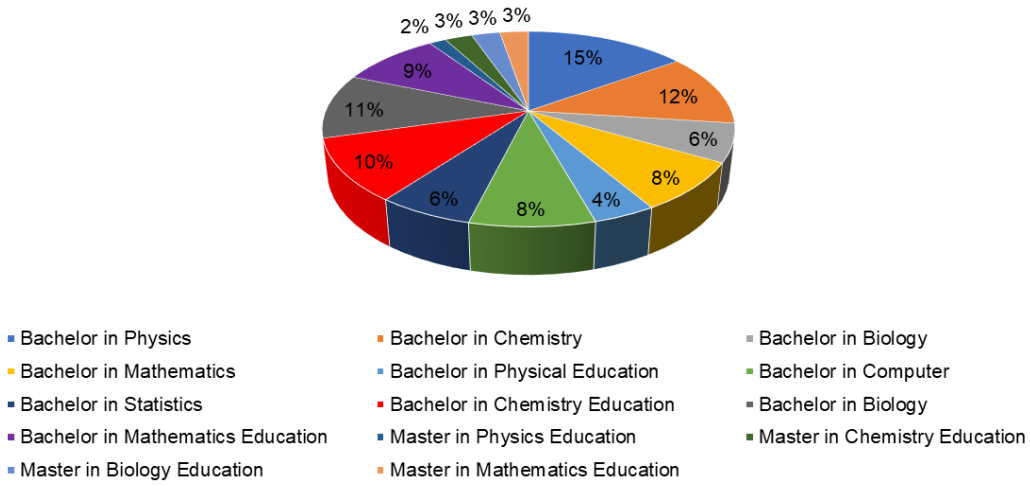


Figure 6. 4 The percentage of student participation

The survey consists of five sections. The first section is the respondent's data, and the second section is academic integrity information and management. The third section is academic integrity violation, and the fourth section is academic integrity application. The last section is plagiarism. The respondent data recorded the respondent's name and study program.

Moreover, the academic information and management section improves students' comprehension of academic integrity. The third section collects information on academic integrity punishment. The fourth section describes how to apply academic integrity in academic activity. Finally, the last section shows the student's comprehension of plagiarism and avoid it.

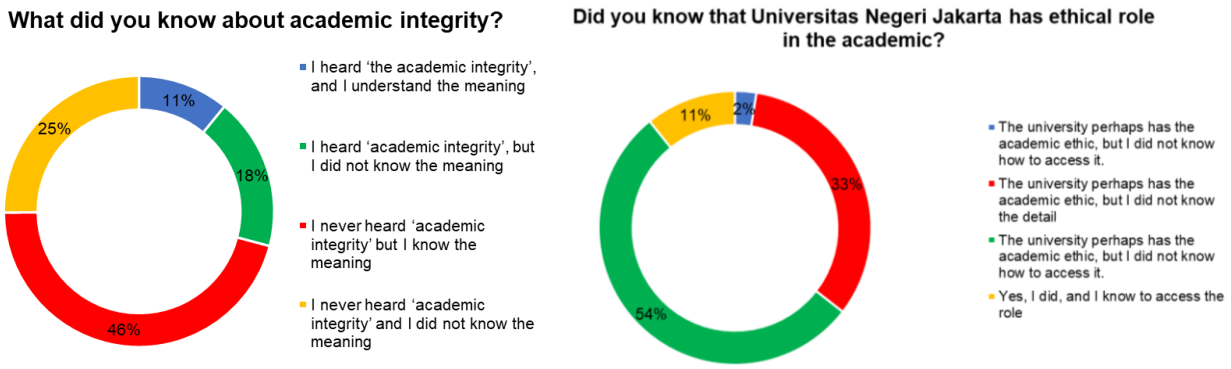


Figure 6. 5 The academic integrity awareness

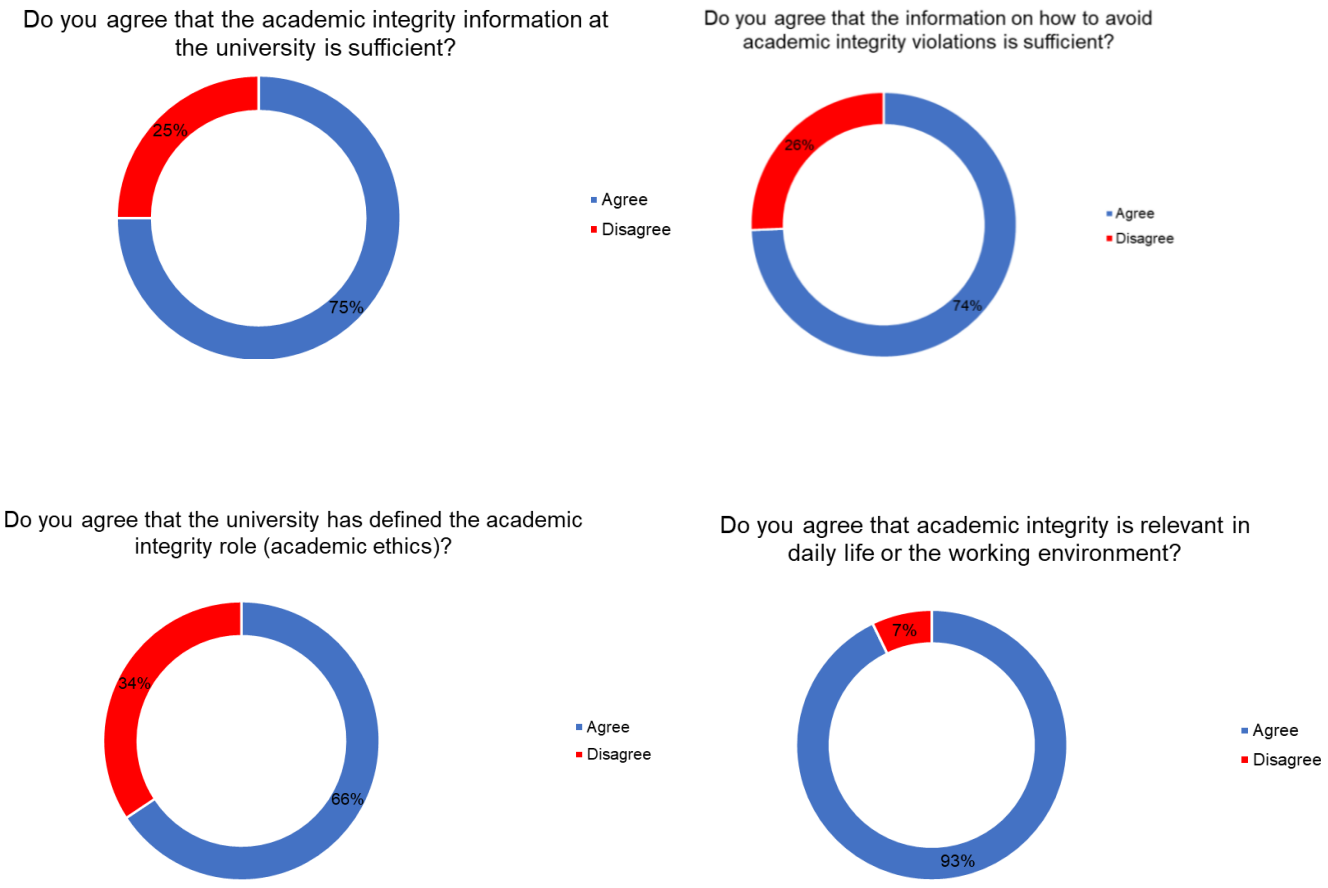


Figure 6. 6 Academic integrity information and management

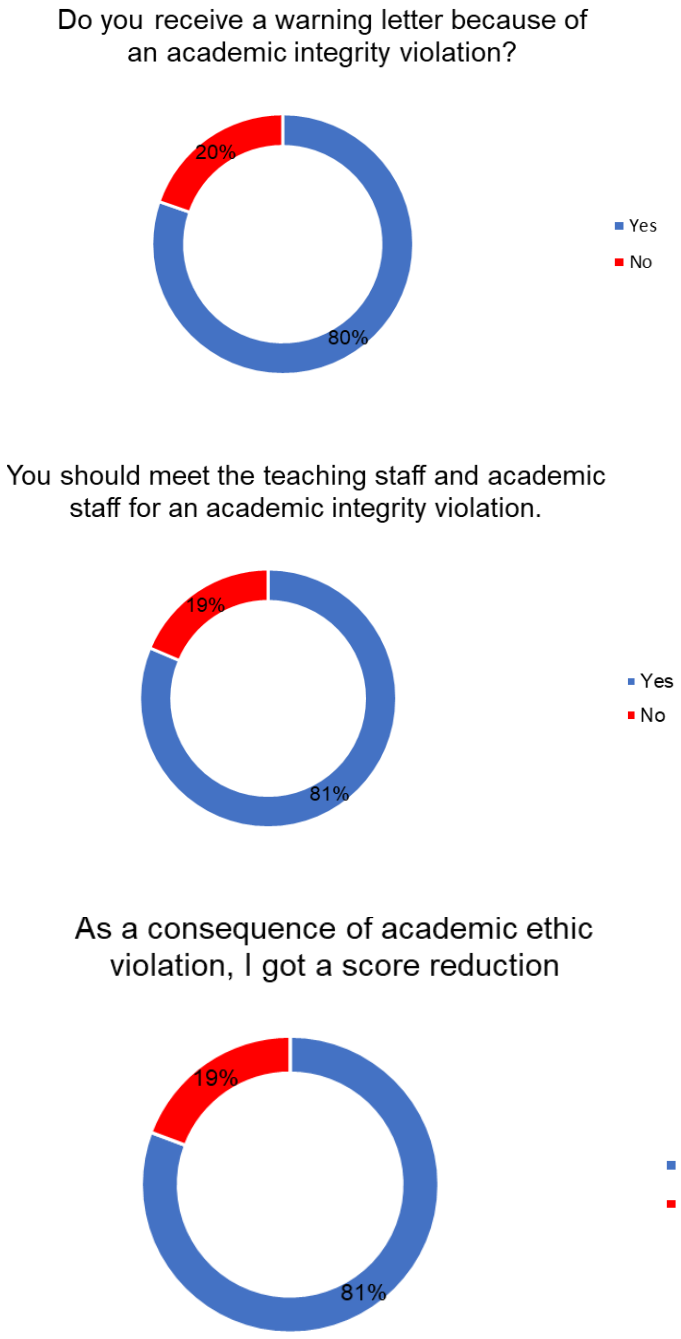


Figure 6. 7 The consequences for Academic Integrity violation

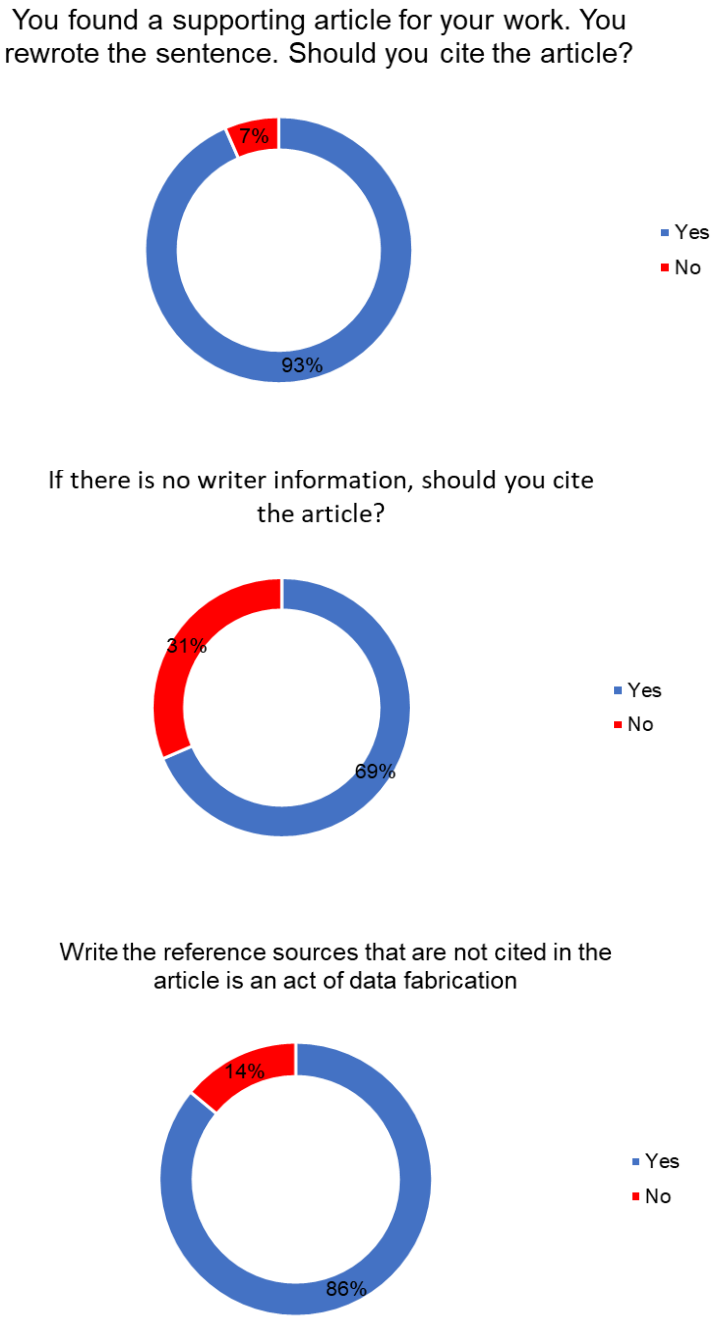


Figure 6. 8 Paraphrase, citation, and references to avoid plagiarism

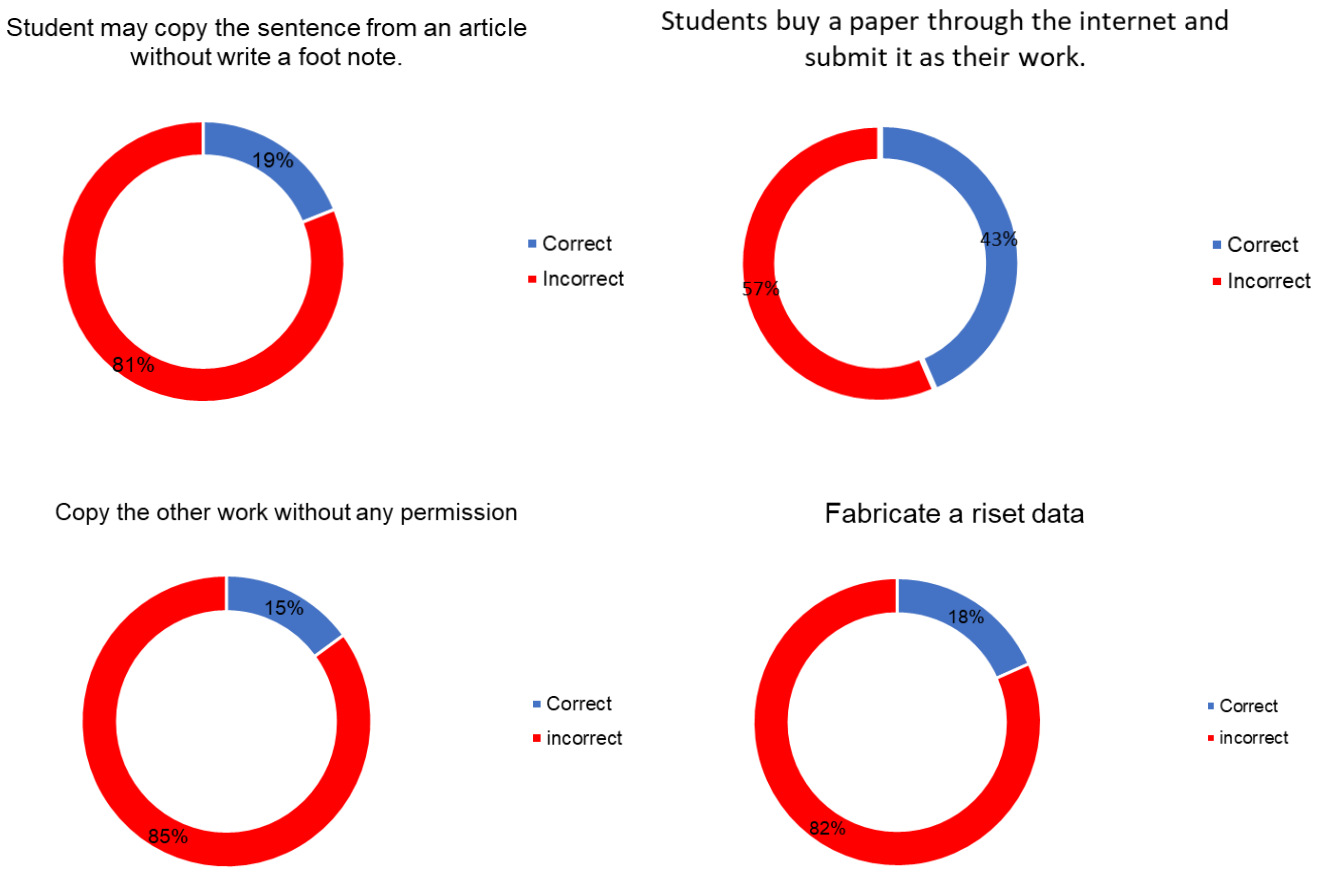


Figure 6. 9 Academic integrity dishonesty

The survey indicated that the university should increase academic integrity information to the students because 11% of students heard and understood the meaning of academic integrity. 18% of students heard academic integrity, but they did not know the meaning, 46% of students never heard academic integrity, but they know it is essential. 25% of students had never heard of academic integrity, and they did not know the meaning. The improvement is to set the academic integrity information on the faculty website and academic book and introduce it in the academic writing course.

6.2.2. Feedback From The Students, Lecturers, Staff, Alumni And Stakeholders

6.2.2.1 Satisfaction survey (Students, Lecturers, Staff)

Each year we ask teaching staff, staff, and students to complete online surveys to give feedback on their time at the University. The insights from these surveys are gained to inform decision-making and improve student-focused initiatives. The surveys are the satisfaction of academic services and university facilities. Moreover, the surveys are available at the following links http://spm.unj.ac.id/?page_id=8241 and http://spm.unj.ac.id/?page_id=8355. The data was obtained from 400 respondents. Furthermore, the results are shown in Figure 6.10 and Figure 6.11.

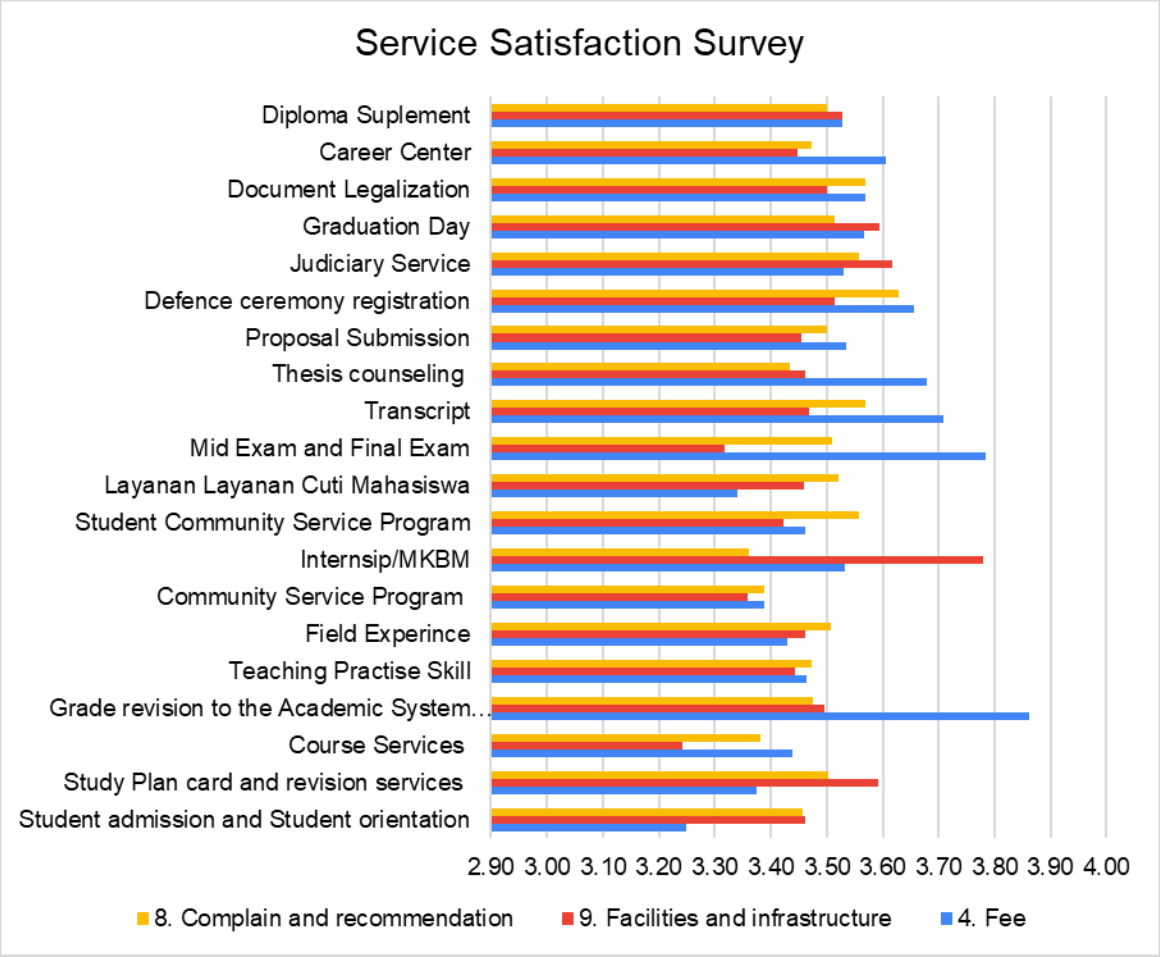


Figure 6. 10 The result of the student survey of academic services

Universitas Negeri Jakarta provides academic services such as student admission, course contract, the learning activity, mid-exam, final exam, and course transcript. Meanwhile, the learning activity consists of internship, teaching practice, field study, community services, MBKM program, thesis, diploma supplement, career counselling, document legalization, and graduation. There are facilities and infrastructure surveys and academic services, which measure the facilities and infrastructure provision, finance, services, and improvement. The result showed that the students' satisfaction score of 19 academic services is 3.24 (scale of 1 to 4).

Besides academic services, we also surveyed the student satisfaction to the university facilities such as counselling services, information and communication technology services, language centre services, health services, and library services. The results are shown in Figure 6.11.

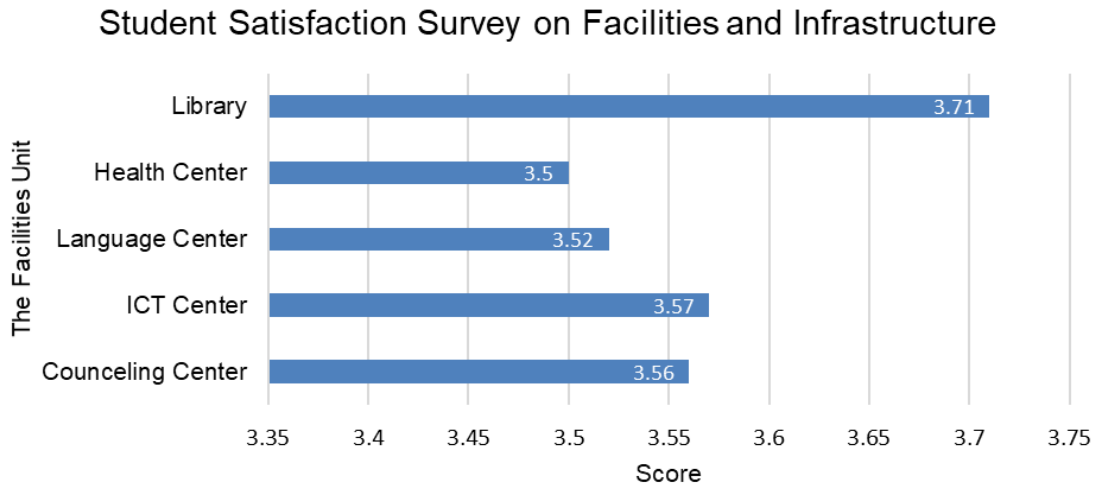


Figure 6. 11 Student satisfaction survey on university facilities

The survey result in Figure 6.11 showed that the students are delighted with the university facilities. The average score is 3.57 (scale of 1 to 4). Specifically, library facilities obtained a higher score which is 3.71. the university always enhances all facilities every year. Therefore, students are comfortable in the learning activities.

The survey results are periodically discussed with students, alumni, and stakeholders. The result brings recommendations and new implementation to improve the academic program. The improved program should meet the university's Key Performance Indicators, such as the work readiness of graduate/alumni, off-campus students, off-campus lecturers, lecturer qualifications, research application, program partnerships, classroom learning, and international accreditation.

6.2.2.2 Tracer Study (Alumni and Stakeholders)

The purpose of the Tracer Study Survey is to gain information on the types and location of employment, the salary ranges, and the further study opportunities graduates may take up after completing their qualifications. The survey is conducted after the student graduate from the university program. The tracer study data was gained from the online survey at the university website https://upt-lbk.unj.ac.id/forms/site/index/tracer-study-2020?sid=9 for Faculty and Mathematics and Natural Science's alumni. The respondents are 272 alumni, 14% male and 86% female. 83% of the alumni are working, 8% are studying, and 9% are unemployed. Additionally, 80% of the alumni get jobs less than six months in local/national/international companies, as shown in Figure 6.12.

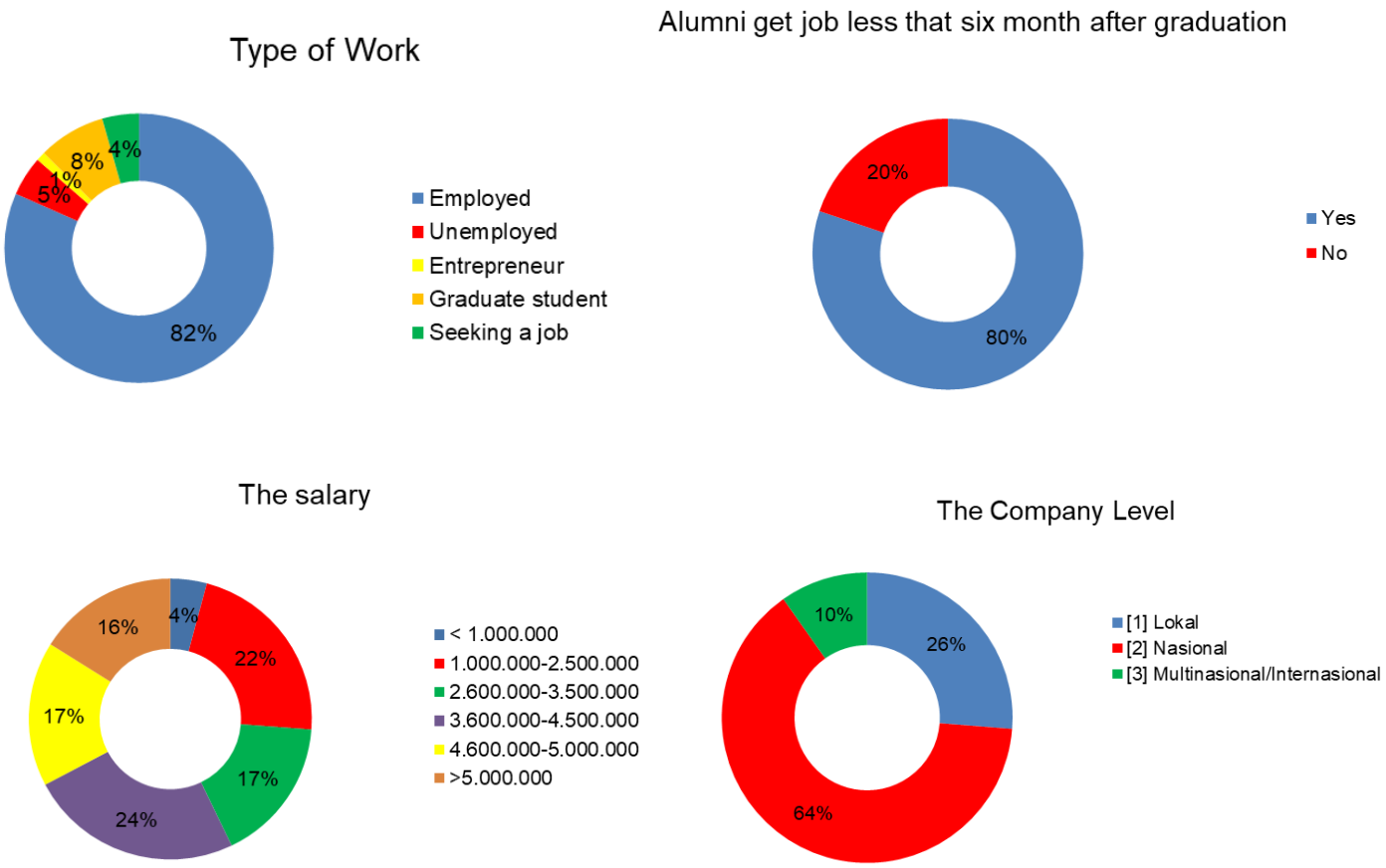


Figure 6. 12 Alumni's career information

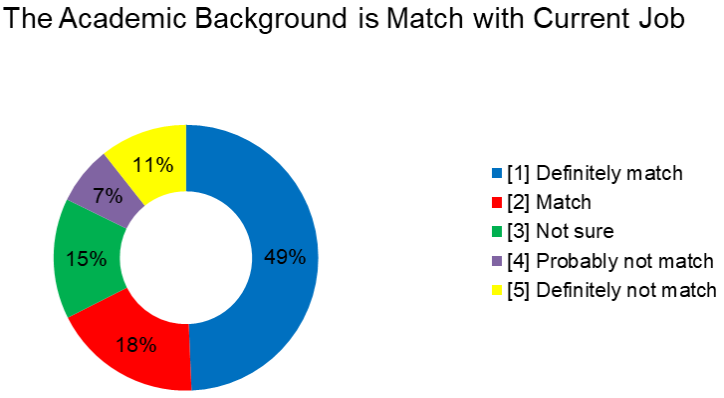


Figure 6. 13 Alumni's career compatibility with the academic background

Finally, the survey result in Figure 6.13 informs us that the alumni job matches their academic background.

6.3. Intended Learning Outcome Measurement

At the program study level (TPjM), the quality assurance conducts an Intended Learning Outcome (ILO) measurement. The measurement aims to determine if the learning process and the course outcome have met the ILO. The measurement components are students' examinations (assignment, mid-exam and final exam), essays, coursework reports, laboratory reports, oral examinations, and presentations. Those components should be applied to the course. In addition, each course has a course outcome that has to be in line with the intended learning outcome. Therefore, each course outcome should support related ILO. The measurement scores are from student comprehension score which consists of excellent (A, A+), good (B+, B, B-), average (C+, C, C-), below average (D), and failed E. the student's comprehension level is shown in the following Table 6.1.

Table 6. 1 The examination scores

Comprehension	Grade	Score
86 – 100	A	4
81 – 85	A-	3.7
76 – 80	B+	3.3
71 – 75	B	3
66 – 70	B-	2.7
61 – 65	C+	2.3
56 – 60	C	2
51 – 55	C-	1.7
46 – 50	D	1
0 – 45	E	0

The student's comprehension aspects are divided into attitude, knowledge, skill, and competencies. Each course can apply one of the comprehensions aspects or combine them here. The ILO rubrics are shown in Table 6.2.

Table 6. 2 The ILO rubrics

Rating=4	Rating=3	Rating=2	Rating=1
Based on the examination assignment, the student showed their ability to identify the concept theory correctly and completely	Based on the examination assignment, the student showed their ability to identify the concept theory correctly but less completely	Based on the examination assignment, the student showed their ability to identify the concept theory correctly	Based on the examination assignment, the student cannot show their ability to identify the concept theory correctly and completely

Finally, the course learning outcomes are compared with the ILO. Each study program has provided the measurement of ILO. Meanwhile, the attitude aspect is measured via a survey at the following link https://fmipa.unj.ac.id/mipabaru/kuesioner-sikap-dan-kecakapan-sosial/.

The survey measures critical thinking, creative thinking, communication, academic integrity, leadership, and collaboration.

6.4. Student Feedback

A student may see their final score only after submitting the feedback for the teaching staff. Therefore, the teaching staff gets input to enhance their teaching performance and course material based on that feedback. The course score and student feedback are available at the academic system or SIAKAD (www.siakad.unj.ac.id). The following figure shows the result of student feedback for teaching staff. The blue line is class score average, the green line is university score average, and the black line is faculty score average. The feedback score is from 0 to 4. The feedback consists of 20 questions with a Likert scale.

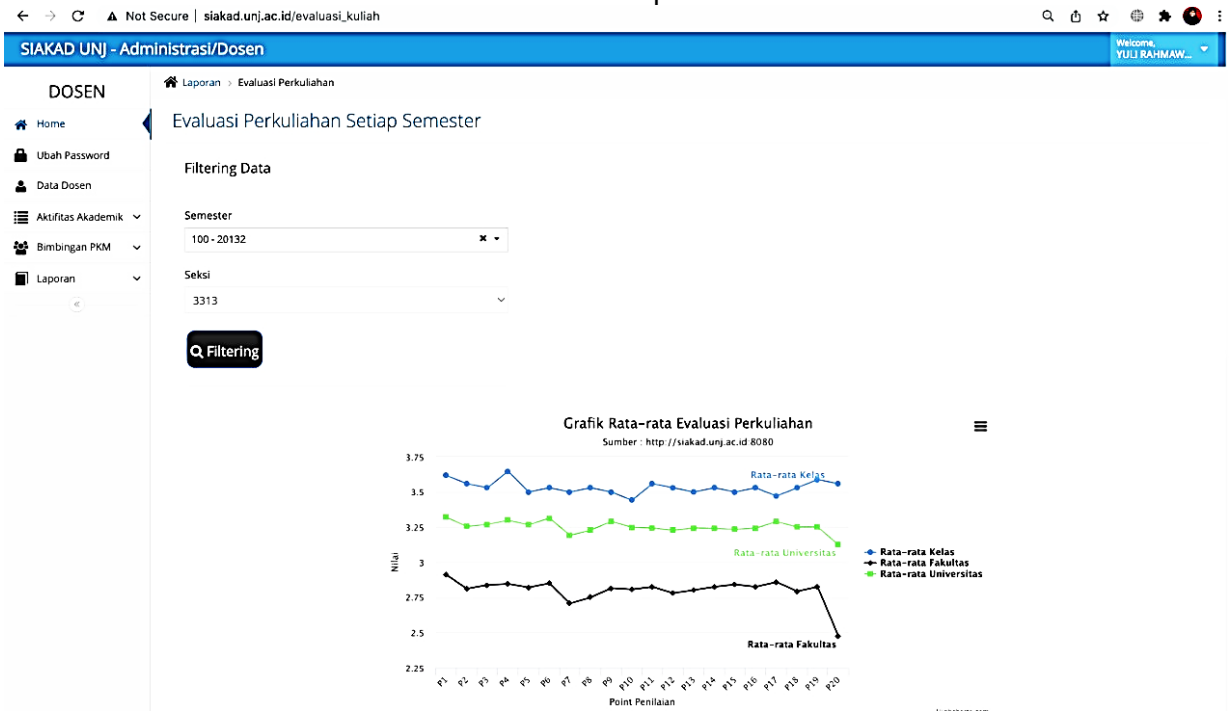
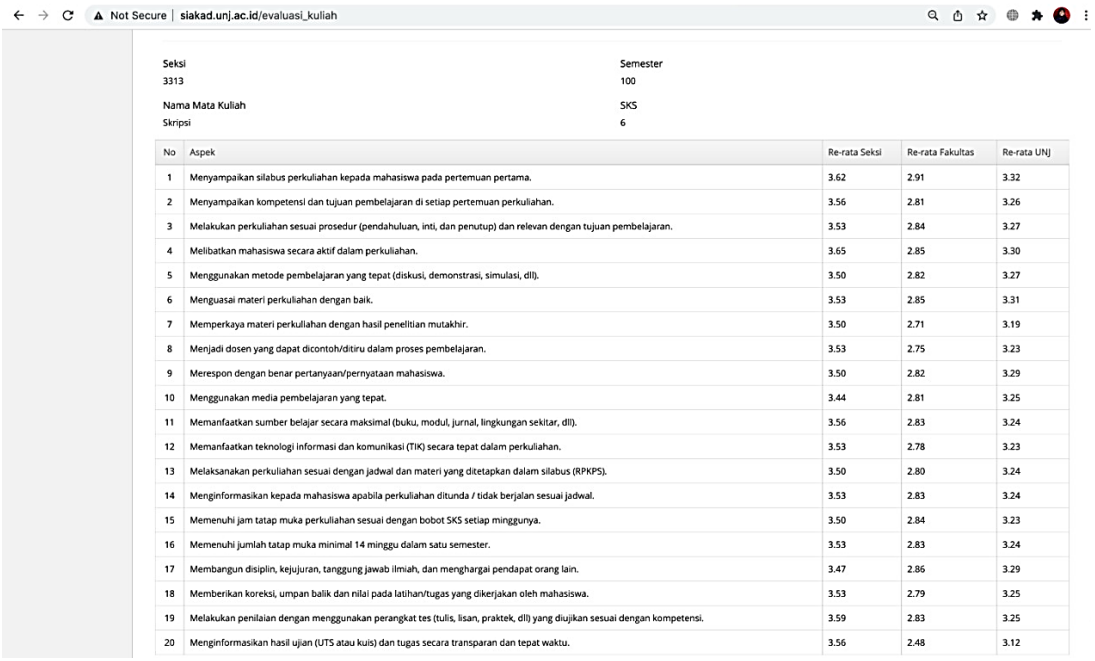


Figure 6. 14 The graph of student feedback for the teaching staff. The blue line is class score average, the green line is university score average, and the black line is faculty score average

The 20 questions are shown below

1. Show the course syllabi to students at the first meeting
2. Inform the course learning outcome
3. Run the course in a systematic method (introduction, core, closing) which relevant to the course learning outcome
4. Students involved in the active learning
5. Conduct the suitable methodology (discussion, demo, simulation, etc.)
6. Comprehend the course material
7. Conduct recent research to support the course material
8. The teaching staff has a good behave
9. Give an excellent response to the student question

10. Apply a proper/appropriate learning media
11. Apply the learning resource maximally (book, module, journal, environment, etc.)
12. Conduct ICT in the course
13. Run the course on schedule
14. Inform the student when the course is cancelled or rescheduled
15. Run the course with appropriate learning hours
16. The course consists of 14 weeks course in a semester
17. Develop discipline, honesty, responsibility, and honour
18. Give feedback to student assignment
19. Score the student comprehension with a proper evaluation
20. Inform the work score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Seksi: 3313 | Semester: 100
Nama Mata Kuliah: Skripsi | SKS: 6

No	Aspek	Re-rata Seksi	Re-rata Fakultas	Re-rata UNJ
1	Menyampaikan silabus perkuliahan kepada mahasiswa pada pertemuan pertama.	3.62	2.91	3.32
2	Menyampaikan kompetensi dan tujuan pembelajaran di setiap pertemuan perkuliahan.	3.56	2.81	3.26
3	Melakukan perkuliahan sesuai prosedur (pendahuluan, inti, dan penutup) dan relevan dengan tujuan pembelajaran.	3.53	2.84	3.27
4	Melibatkan mahasiswa secara aktif dalam perkuliahan.	3.65	2.85	3.30
5	Menggunakan metode pembelajaran yang tepat (diskusi, demonstrasi, simulasi, dll).	3.50	2.82	3.27
6	Menguasai materi perkuliahan dengan baik.	3.53	2.85	3.31
7	Memperkaya materi perkuliahan dengan hasil penelitian mutakhir.	3.50	2.71	3.19
8	Menjadi dosen yang dapat dicontoh/ditiru dalam proses pembelajaran.	3.53	2.75	3.23
9	Merespon dengan benar pertanyaan/pernyataan mahasiswa.	3.50	2.82	3.29
10	Menggunakan media pembelajaran yang tepat.	3.44	2.81	3.25
11	Memanfaatkan sumber belajar secara maksimal (buku, modul, jurnal, lingkungan sekitar, dll).	3.56	2.83	3.24
12	Memanfaatkan teknologi informasi dan komunikasi (TIK) secara tepat dalam perkuliahan.	3.53	2.78	3.23
13	Melaksanakan perkuliahan sesuai dengan jadwal dan materi yang ditetapkan dalam silabus (RPKPS).	3.50	2.80	3.24
14	Menginformasikan kepada mahasiswa apabila perkuliahan ditunda / tidak berjalan sesuai jadwal.	3.53	2.83	3.24
15	Memenuhi jam tatap muka perkuliahan sesuai dengan bobot SKS setiap minggunya.	3.50	2.84	3.23
16	Memenuhi jumlah tatap muka minimal 14 minggu dalam satu semester.	3.53	2.83	3.24
17	Membangun disiplin, kejujuran, tanggung jawab ilmiah, dan menghargai pendapat orang lain.	3.47	2.86	3.29
18	Memberikan koreksi, umpan balik dan nilai pada latihan/tugas yang dikerjakan oleh mahasiswa.	3.53	2.79	3.25
19	Melakukan penilaian dengan menggunakan perangkat tes (tulis, lisan, praktek, dll) yang diujikan sesuai dengan kompetensi.	3.59	2.83	3.25
20	Menginformasikan hasil ujian (UTS atau kuis) dan tugas secara transparan dan tepat waktu.	3.56	2.48	3.12

Figure 6. 15 The 20 questions in the student's feedback

6,5, Student Drop Out Rate

The dropout rate is the percentage of students who do not complete their studies or education. The dropout rate is calculated by comparing the number of dropout students (A) with the number of graduates (B) and dropout students (A). The details of graduates and dropout students' numbers are shown in Table 6.3. The dropout criteria are that the student is not active in two semesters successively and cannot finish their study on time or at a specified time.

Table 6.3. The dropout rates

Aspect	Academic Year		
	2019	2020	2021
Number of Dropout (A)	28	45	31
Number of Graduates (B)	257	415	449
Dropout Ratio (A/(A+B))	9.8%	10.8%	0.6%