# ASIIN Seal

# Accreditation Report

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

Provided by
**Universitas Sebelas Maret, Indonesia**

Version: 23 June 2023

# Table of Content

# A About the Accreditation Process

| Name of the degree programme (in original language) | (Official) English translation of the name | Labels applied for [1] | Previous accreditation (issuing agency, validity) | Involved Technical Committees (TC)[2] |
|---|---|---|---|---|
| Program Studi Sarjana Pendidikan Biologi | Undergraduate programme in Biology Education | ASIIN | BAN-PT: "A"<br>2019 - 2024 | 10 |
| Program Studi Sarjana Pendidikan Kimia | Undergraduate programme in Chemistry Education | ASIIN | BAN-PT: "A"<br>2019 - 2024 | 09 |
| **Date of the contract:**.15.07.2021<br>**Submission of the final version of the self-assessment report:** 11.10.2022<br>**Date of the audit (online):** 01.02. – 03.02.2022 | | | | |
| **Peer panel:**<br>Prof. Dr. David-Samuel Di Fuccia, University of Kassel<br>Prof. Dr. Kerstin Kremer, Justus Liebig University Gießen<br>Prof. Dr. Thomas Waitz, University of Göttingen<br>Medina Andini, SMA Khadijah Surabaya<br>Natasya Helma Noerjannah, Universitas Islam Indonesia, student | | | | |
| **Representative of the ASIIN headquarter:**<br>Rainer Arnold | | | | |
| **Responsible decision-making committee:**<br>Accreditation Commission for Degree Programmes | | | | |

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

| | |
|---|---|
| **Criteria used:**<br><br>European Standards and Guidelines as of 15.05.2015<br><br>ASIIN General Criteria as of 28.03.2014<br><br>Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 29.03.2019<br><br>Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019 | |

# B Characteristics of the Degree Programmes

| a) Name | Final degree (original) | b) Areas of Specialization | c) Corresponding level of the EQF[3] | d) Mode of Study | e) Double/Joint Degree | f) Duration | g) Credit points/unit | h) Intake rhythm & First time of offer |
|---|---|---|---|---|---|---|---|---|
| Undergraduate programme in Biology Education | Sarjana Pendidikan/ Bachelor of Education in Biology | - | 6 | Full time | no | 8 Semester | 148 CSU / 239.67 ECTS | 1979, Once a year (July) |
| Undergraduate programme in Chemistry Education | Sarjana Pendidikan/ Bachelor of Education in Chemistry | - | 6 | Full time | no | 8 Semester | 145 CSU / 234.39 ECTS | 1979, Once a year (July) |

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

For the Bachelor's degree programme Biology Education (BBESP), Universitas Sebelas Maret (UNS) has presented the following profile on its webpage:

"**VISION**

Becoming an international reputable Biology Education Study Program based on the noble values of national culture

**PROGRAM EDUCATIONAL OBJECTIVES**

The graduates of the BBE Program are expected to have competencies as follows:

1. Consistently demonstrate the eagerness to do independent learning and advanced study for improving their professionalism
2. Applying knowledge and skills to solve a general and specific problems in biology and teaching-learning
3. Respect diversity and pluralism, be able to work in multi-discipline and multi-culture teamwork, and have the entrepreneur mindset

**Graduate Profile**

PP-1 **Biology Educator:** Graduates who are qualified as an educator that can easily integrate *subject core of knowledge* (biology), pedagogy, and technology in planning, implementing, and evaluating for biology learning process professionally at national and international levels and upholding national culture.

PP-2 **Researcher:** Graduate who are qualified as a researcher who can work in research teams, apply scientific research principles in the field of biology and learning, and communicate the results in national and international forums.

PP-3 **Entrepreneur:** Graduates who are qualified as an entrepreneur who can plan business systematically in their area of expertise, realize business development plans, apply managerial principles, have an innovative spirit, creativity, able to lead, make fair decisions, and build networks of cooperation with related parties in their line of business."

For the Bachelor's degree programme Chemistry Education (BCESP), Universitas Sebelas Maret (UNS) has presented the following profile on its webpage:

"**Vision:**

"Become a study program with international reputation and contribute to the development of science and technology in chemistry education based on the noble values of national culture."

**Mission:**

1. Organizing innovative education and learning based on the latest developments in the field of chemistry education;
2. Carry out research and development that supports the implementation of chemistry education and learning, and publish it at the national and international levels;
3. Organizing community service activities in the field of chemistry and chemical education to improve the quality of chemistry education and expand cooperation networks.

**Goals to be achieved:**

1. Produce graduates who are faithful and devoted to God, have noble personality, have global insight, have a high cumulative achievement index and are ready to become educators, researchers, or educational entrepreneurs with shorter waiting periods;
2. Produce new development works that support the implementation of chemistry education and learning, as a basis for solving problems in society and for building a better life and disseminating it to achieve national and international recognition;

Produce works of community service that are able to solve practical problems in the field of Chemistry Education, and increase collaboration networks in order to realize an internationally reputable study program."

# C Peer Report for the ASIIN Seal

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

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

**Evidence:**

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Homepage UNS: https://uns.ac.id/en/
- Homepage FTTE: https://fkip.uns.ac.id/en/
- Homepage Chemistry Education: https://kimia.fkip.uns.ac.id/
- Homepage Biology Education: https://biologi.fkip.uns.ac.id/en/
- Discussions during the audit

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

For both undergraduate programmes, Universitas Sebelas Maret (UNS) has described and published Programme Educational Objectives (PEO) and Programme Learning Outcomes (PLO). While the PEO are rather general and refer to the vision and mission of the Faculty of Teacher Training and Education (FTTE), the PLO cover a number of specific competences students should acquire in their respective degree programme. Both, PEO and PLO of each degree programme are published on the programme's website and can be found in the Curriculum Summary.

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

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

BBESP is designed to produce competitive graduates with competences to work as biology educators/teachers, who are able to plan, implement, evaluate, and develop modern biology learning. As junior researcher assistants, graduates should be able to examine issues in biology and biology learning by implementing scientific methods. As entrepreneurs, graduates should be qualified to manage a business unit and to develop local biological-based business ideas through innovation and creativity.

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

BCESP graduates should acquire a basic knowledge of natural sciences and gain methodological and educational competences in the chemical sciences (analytical chemistry, organic chemistry, inorganic chemistry, physical chemistry, and biochemistry) in order to learn about the structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis and characterization of chemicals. Furthermore, graduates should also be able to carry out practical work in laboratories and to prepare experiments. Moreover, students should be familiar with the safe handling of laboratory equipment and chemicals and have knowledge about safety and environmental issues. In addition, graduates should acquire the necessary skills to work scientifically as well as in the field of education, adhering to modern methodologies and theoretical concepts in chemistry learning and teaching. This includes designing, implementing, and evaluating chemistry learning media by utilizing Information and Communication Technology. This should qualify graduates to handle chemistry-learning problems and to provide quality chemistry learning that is conducted in classroom or institutions based on scientific data and analysis. Most of the BCESP graduates

will find a suitable occupation as high school teachers, managers of educational institutions, junior researchers, and entrepreneurs.

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

During the audit, the peers discuss with students, teachers, and alumni where the graduates can find suitable jobs. They learn that graduates mostly work as teachers in senior and junior high schools. However, students not only acquire educational competences but also competences related to entrepreneurship. Graduates also publish books on education, run digital platforms to support teachers and students, or develop instruments for high school laboratories apparatus and material for primary and secondary schools

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

**Criterion 1.2 Name of the degree programme**

**Evidence:**

- Self-Assessment Report

**Preliminary assessment and analysis of the peers:**
UNS awards a Bachelor of Education (B.Ed.) or Sarjana Pendidikan (S.Pd.) degree to the graduates of both undergraduate programmes.

The names of the degree programmes properly reflect the respective focus and content of the undergraduate programmes, which is on education in the respective scientific area.

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

## Criterion 1.3 Curriculum

**Evidence:**

- Study plans of the degree programmes
- Module descriptions
- UNS Academic Guidelines
- Homepage UNS: https://uns.ac.id/en/
- Homepage FTTE: https://fkip.uns.ac.id/en/
- Homepage Chemistry Education: https://kimia.fkip.uns.ac.id/
- Homepage Biology Education: https://biologi.fkip.uns.ac.id/en/
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**
Both undergraduate programmes are offered by the Faculty of Teacher Training and Education (FTTE) of Universitas Sebelas Maret (UNS).

The Bachelor's degree programme under review are designed for four years and are offered as full time programmes. In BCESP, 148 credit semester units (CSU) need to be achieved by the students (this is equivalent to 239.76 ECTS points). In BBESP, the curriculum encompasses 145 CSU (234.39 ECTS points).

All undergraduate programmes at UNS are designed to be completed in 8 semesters or four academic years with a maximum of 14 semesters or 7 academic years. Each semester is equivalent to 14 weeks of learning activities. Besides these learning activities, there is one week for midterm exams and one week for final exams. The odd semester starts in August and ends in January of the following year, while the even semester last from February to July.

The BBESP curriculum focuses on biology teacher education and is divided into six different areas, namely:

1. Basic Knowledge with two compulsory courses in Basics of Science and Mathematics, and Biostatistics (2 CSU each).

2. Subject-Specific Biology Knowledge, in this area (59 CSU) compulsory courses from the different biological subjects (e.g. General Biology, Environmental Science, Plant Physiology, Animal Anatomy and Histology, Microbiology, Biotechnology, Human Anatomy and Physiology, Genetics, Ecology, Evolution, Biochemistry, and Biostatistics) are offered.
3. Pedagogical Content Knowledge, with compulsory courses (27 CSU) such as Educational Science, Learner Development, Inclusive Education, Digital Class Management, Guidance and Counselling, Microteaching, Biology Learning Strategy, Biology Lesson Planning, Basic Teaching Skills, Biology Learning Evaluation, High School Biology Curriculum Analysis, and Biology Learning Media.
4. Research and Publication, in this area (14 CSU), students have to prepare and conduct the Bachelor's thesis. It also includes compulsory courses such as Biology Education Research, Biology Research, and Basics of Scientific Writing.
5. Professional Knowledge Skills (12 CS) with courses such as Religious Education, Civics, Pancasila, Indonesian Language, Entrepreneurship, Community Service (KKN), English for Academic Purposes, and School Internship (PPL).
6. Elective courses (29 CSU), here students can selected different courses with either subject specific or pedagogic topics. They can also chose general courses (e.g. Work Practise, Humanitarian Project, and Entrepreneurial Activities) that are offered by other Faculties of UNS.

The BCESP curriculum consists of eight different areas:

1. High Education compulsory courses, which convey personality and social-humanity competencies. This area encompasses four compulsory courses (Religious education, Pancasila Education, Civic education, and Indonesian Language) with 2 CSU each. These courses are university requirements are courses that need to be attended by all undergraduate students at UNS.
2. Education Basics Courses, which convey basic pedagogical competencies. This area encompasses five compulsory courses (Educational Science, Student Development, Digital Classroom Management, Inclusive Education, and Guidance and Counselling) with 2 CSU each.
3. Learning Process Skill Courses, which convey specialised pedagogical competencies. This area encompasses six compulsory courses (Teaching and Learning Strategy, Learning Process and Outcomes Evaluation, Lesson Planning, Capita Selecta on Senior

High School Chemistry, Capita Selecta on Vocational High School Chemistry, and Micro Teaching) with 2 CSU each.

4. Study/Professional Expertise Courses, which convey subject specific competencies in chemistry. This area covers the main chemical subjects such organic chemistry, inorganic chemistry, physical chemistry, biochemistry, and analytical chemistry. It encompasses 34 courses with 71 CSU.
5. Entrepreneurship Competency Courses, which convey competencies that should help students to join the private sector or to set up their own business. This area encompasses 6 CSU in four compulsory courses (Entrepreneurship, Chemistry Workshop (theory and practice), Chemical Products and Chemical Education Business, and Field Study to industries).
6. Researcher Competency Courses, which are designed to introduce students to scientific methods and research activities. This area encompasses 15 CSU in six compulsory courses (Statistics, Research Methodology, Research in Chemistry, Colloquium, and Thesis 1 + 2).
7. Work, managerial, authority, and responsibility competency courses, which convey supporting competencies. This area encompasses 12 CSU in five compulsory courses (English for Academic Purposes, English for Chemistry, Technology and Coding for Chemistry, Community Service, and School Internship)
8. Elective courses (14 CSU), here students can selected different courses with either subject specific or pedagogic topics. They can also chose general courses (e.g. Work Practise, Humanitarian Project, and Entrepreneurial Activities) that are offered by other Faculties of UNS.

The peers discuss with the programme coordinators in which courses practical work in schools is included. They learn that for providing in-field learning experience, the educational undergraduate programmes include an internship programme, which is called “Field School Internship (PLP)”. Students will spend at least six weeks at a school in order to gain practical teaching experience. They also learn pedagogical strategies from their mentor teacher at the school. By the end of the programme, students are required to write a fieldwork report. The final grade for the internship programme is based on the students’ performance at the school and the fieldwork/internship they submit. UNS has established cooperation agreements with several schools for conducting their teaching internship there. Moreover, students can conduct the community service in schools all around Indonesia and students can also go abroad e.g. to the Philippines for their teaching internship.

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

In the BCESP programme, since August 2021 an international class is offered in addition to the regular class. Teaching and learning in this class are conducted bilingual, which involves teaching academic content in two languages, in Bahasa Indonesia and English. Otherwise, there are no differences in the curriculum and in the content of courses. Graduates of the international class are expected to be able to provide chemistry-instruction in English for high school students.

Since UNS has the goal to become internationally more visible and wants to further internationalise its degree programmes, the peers discuss with the programme coordinators and students if any classes at FTTE are taught in English. The programme coordinators explain that there is an international class in BCESP, which is taught bilingual in English and Bahasa Indonesia. Even in the regular classes, English textbooks are used and some presentations are done in English. The peers appreciate the existence of an English taught class in BCESP; however, they are convinced that it would be very useful to offer an international class also in the BBESP programme. This would further improve the students' English proficiency and better prepare them for the job market. In the discussion with the peers, students and alumni support this point of view.

The peers see that some members of the teaching staff in the Faculty of Teacher Training and Education have international experience or contacts (e.g. have graduated from an international university and/or collaborate with colleagues from abroad). This is a good starting point for establishing more international co-operations in order to further promoting the students' academic mobility (see criterion 2.1).

The members of the teaching staff explain on demand of the peers that they offer possible topics for the final projects according to their own research projects. All members of the

teaching staff supervise theses. Students have to design a research proposal (this proposal is developed in the "seminary course", which usually takes place in the seventh semester) with a time schedule for the project, which is discussed with the academic advisor. If they agree, students apply formally for being allowed to work on the suggested topic. Students can also develop their own ideas for their Bachelor's thesis and it is possible to conduct the Bachelor's thesis outside UNS. However, the focus of the topics is on chemistry or biology education.

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

**Criterion 1.4 Admission requirements**

**Evidence:**

- Self-Assessment Report
- UNS Academic Guidelines
- Homepage UNS: https://uns.ac.id/en/
- Homepage FTTE: https://fkip.uns.ac.id/en/
- Homepage Chemistry Education: https://kimia.fkip.uns.ac.id/
- Homepage Biology Education: https://biologi.fkip.uns.ac.id/en/
- Discussions during the audit

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

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

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

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

3. UNS Campus Admission Test (SM-UNS) students are selected based on a test specifically held by UNS for prospective students that haven not been accepted through SNMPTN or SBMPTN.

The entrance requirements are prepared by the universities and then forwarded to the National Testing Agency for State Universities to be accessible to all SNMPTN and SBMPTN applicants. Through SNMPTN 40 % of the new students are admitted, through SBMPTN also 40 %, and through the campus admission test 20 %. In 2021, with the change of UNS status to PTN-BH (Legal Entity State University), the student admission composition has changed: 20 % through SNMPTN, 30 % through SBMPTN, and 50 % of the new students through the Campus Admission Test.

To support foreign students, UNS offers various types of scholarships, which include tuition waivers, dormitory rooms, Indonesian language courses, and support for living costs. Management of admissions and services of foreign students is handled by the Technical Implementation Unit for International Cooperation and Services at university level, and the International Office Teams in each faculty.

The number of available study places is between 80 to 100 students per year in both undergraduate programmes. The quota is based on the number of teachers and the capacity of the available facilities.

The details are depicted in the following tables:

**BBESP:**

| Admission System | 2017 | | | 2018 | | | 2019 | | | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio |
| SNMPTN | 539 | 22 | 1:25 | 569 | 22 | 1:26 | 345 | 26 | 1:13 | 325 | 22 | 1:15 |
| SBMPTN | 901 | 32 | 1:28 | 797 | 43 | 1:19 | 732 | 42 | 1:17 | 359 | 39 | 1:9 |
| UNS Campus Admission Test | 521 | 19 | 1:27 | 966 | 5 | 1:193 | 353 | 22 | 1:16 | 275 | 26 | 1:11 |
| Total | 1.961 | 73 | 1:27 | 2.332 | 70 | 1:33 | 1.430 | 90 | 1:16 | 959 | 87 | 1:11 |

**BCESP:**

| Admission System | 2017 | | | 2018 | | | 2019 | | | 2020 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio | Applicants | Accepted | Acceptance Ratio |
| SNMPTN | 360 | 23 | 1:16 | 366 | 24 | 1:15 | 186 | 23 | 1:8 | 209 | 20 | 1:10 |
| SBMPTN | 454 | 32 | 1:14 | 519 | 36 | 1:14 | 390 | 33 | 1:12 | 252 | 40 | 1:6 |
| UNS Campus Admission Test | 370 | 21 | 1:18 | 555 | 14 | 1:40 | 201 | 23 | 1:9 | 367 | 41 | 1:9 |
| Total | 1184 | 76 | 1:16 | 1440 | 74 | 1:11 | 777 | 79 | 1:10 | 828 | 101 | 1:8 |

In the BCESP programme, an international class and a "regular" class are offered. The number of students accepted for the international class is 22. Students have to apply for joining the international class at the end of their second semester and need to have a high score in their English language courses.

Undergraduate students at UNS have to pay tuition fees (UKT). The fees for each study programme vary according to the operational costs of learning. In addition, UKT for each student is also different according to the financial ability of their parents. The lowest UKT in 2021 for BCESP and BBESP were IDR 475,500 (EUR 29.28) and the highest IDR 9,552,500 (EUR 588.23) per year.

In addition, several grants for students with financial difficulties are available, such as from the government, industries, foundations, and UNS alumni association. Some senior students work as laboratory assistants to earn some money for financing their studies.

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

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

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

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

The peers appreciate that UNS plans to offer an English class in BBESP from next semester (August 2022). This will further support the efforts to internationalise UNS and obviously, there is a demand from the students.

The peers consider criterion 1 to be fulfilled.

# 2. The degree programme: structures, methods and implementation

**Criterion 2.1 Structure and modules**

**Evidence:**

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Homepage Chemistry Education: https://kimia.fkip.uns.ac.id/
- Homepage Biology Education: https://biologi.fkip.uns.ac.id/en/
- Discussions during the audit

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

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

The curriculum in the first two semesters is very similar for both undergraduate programmes. Courses in the first two semesters convey basic knowledge of natural sciences, mathematics, education and languages (Indonesian and English). In addition, students need to attend obligatory courses, such as religion and ethics, pancasila and civic education, which are university requirements and need to be attended by all students at UNS. From the third semester on, more subject-specific classes, with a focus on the respective science area (biology, chemistry), and several educational courses are offered. In the third year of studies, advanced concepts in pedagogics and the respective science are taught. During the seventh and eighth semester, students must complete the Community Service and the Bachelor's thesis.

The Bachelor's degree programme Biology Education requires students to complete 145 CSU (234.9 ECTS), which includes compulsory courses (116 CSU) and a minimum of 29 CSU of elective courses.

In the Bachelor's degree programme Chemistry Education, students are required to complete 148 credit units (CSU), which equivalent to 239.8 ECTS, including 134 CSU of compulsory courses and 24 CSU of elective courses.

The programme coordinators explain upon request that in BBESP, no separate course in Bioinformatics is offered, but students can choose Molecular Biology as an elective. However, the concepts of bioinformatics are included in some courses, such as "Diversity and Classification of Vertebrate". In those courses, the students learn about how to use the DNA sequence obtained from the Bioinformatics database (NCBI) to simulate the Phylogeny and classification of the vertebrate. In the Biotechnology course, there are some topics related to bioinformatics, such as the introduction of molecular database, gene analysis and some topics in molecular biology are discussed. The peers are convinced that UNS should put more emphasis on teaching modern areas of biology such as bioinformatics and molecular biology. These topics are becoming increasingly important and biology education students should to be familiar with them.

The peers notice that in BCESP, there is course named "Field Study to Industries" and no credits are awarded for this course. The programme coordinators explain that this course is a part of the entrepreneurship competency courses offered by UNS; it offers an additional experience for students to get industrial exposure and 0.3 CSU (0.49 ECTS) are awarded. The peers point out that this should be made transparent in the study plan.

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

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

*International Mobility*

UNS provides some opportunities for students to conduct internships and exchange programmes abroad. Students who take part in student exchanges through cooperation programmes can gain recognition of the acquired credits after obtaining approval from their undergraduate programme. The credits acquired abroad are transferable to UNS, although

this transfer of credits is only possible if an agreement exists between UNS and the involved international university. This agreement regulates the details of the transfer, such as the list of courses that can be transferred, the minimum grade, equivalency of curriculum between universities, etc.

Students' international academic mobility is supported by UNS. For example, through scholarships such as the UNS Global Challenge Program (since 2016), SEATEACHER-SEAMEO Programme (since 2016) managed at FTTE, International Students Mobility Awards (IISMA), scholarship programme from the Ministry of Education and Culture starting from 2021, and International Credit Transfer (ICT) organized by Belmawa Dikti. In addition, lecturers are encouraged to carry out joint research activities with international partners and to involve students in their projects.

As the peers learn during the audit, the Department of Biology conducts international summer schools e.g. for observing and studying primates in Indonesia. This would be a very interesting offer also for European students and UNS should further promote this activity.

Although, some international co-operations with other Asian countries such as Taiwan, Thailand, Philippines, and Japan exist, especially the number of Indonesian students spending some time abroad is rather low. BCESP has implemented an international student exchange programme in 2016. According to the statistical data presented in the Self-Assessment Report, seven BCESP students participated in international student mobility programmes from 2016 to 2019. Six students participated in the SEA-TEACHER Program to the Philippines and Thailand and one student participated in a one-semester internship programme in Germany. There were also six students, who took part in the mobility programme at national level.

Since 2016, BBESP students have the opportunity to take part at mobility programmes. However, due to the scholarship restrictions, especially for the SEA-TEACHER Project, the possibilities for students to join the international programmes are limited. According to the statistical data presented in the Self-Assessment Report, eight BBESP students participated in international student mobility programmes in 2020 and 2021. They took classes at universities in China, Japan, USA, and UK. Mobility within Indonesia is higher. For example, in 2021, there were 58 students, who joined the national student mobility programmes, and 42 students from outside UNS took classes in BBESP.

To promote academic mobility, UNS has an International Office, where students can get information about academic mobility. It also offers a website, which provides information such as the requirements that students need to know before applying for one of the exchange programmes. A positive aspect of the educational undergraduate programmes is the internship that can be conducted at an international school in Indonesia or a school

abroad. Students confirm that FTTE provides opportunities to join national and international schools; however, the students' academic mobility is very limited despite students' high interest. Only few Bachelor's students are studying abroad for a limited period. The number of available places in the exchange programmes is limited and there are restrictions due to a lack of sufficient financial support.

The auditors emphasize that it is very useful for students to spend some time abroad already during their Bachelor's studies to improve their English proficiency, to get to know other educational systems, and to enhance their job opportunities. Furthermore, FTTE should initiate more international exchange programmes, offer more places at international schools, and provide more scholarships for students. FTTE should extend the collaboration with international schools, both in Indonesia and in other ASEAN countries. On the other hand, the peers acknowledge that FTTE regularly invites academics from renowned international universities as guest lecturers.

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

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

### Criterion 2.2 Work load and credits

**Evidence:**

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

**Preliminary assessment and analysis of the peers:**
Based on the National Standards for Higher Education of Indonesia (SNPT), both undergraduate programmes under review use a credit point system called CSU.

For regular classes, 1 CSU of academic load for the undergraduate programme is equivalent to 3 academic hours, which equals 170 minutes. This includes:

- 50 minutes of scheduled contact with the teaching staff in learning activities,

- 60 minutes of structured activities related to lectures, such as doing the assignments, writing papers, or studying literature,
- 60 minutes of independent activities outside the class room to obtain a better understanding of the subject matters and to prepare academic assignments such as reading references.

For lab work, final project, fieldwork, and other similar activities, 1 CSU is equivalent to 3 to 5 hours a week of student's activities. The details and the students' total workload are described in the respective module description.

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

The peers point out that there can be no fixed conversion rate between CSU and ECTS points, but the ECTS points need to be calculated separately for each course. This can be easily done by dividing the students' total workload, which is described in detail in the respective module description, by the number of hours that is required for one ECTS. In addition, UNS needs to determine, how many hours of students' total workload are needed for awarding one ECTS point, because in the Self-Assessment Report, UNS calculates with a range between 25 and 30 hours per ECTS point, on the other hand, in several module descriptions 28 hours per ECTS point are calculated. If UNS calculates 28 hours per ECTS point, this regulation needs to be made transparent, so that external stakeholders are informed about the actual workload of the single courses and the whole degree programmes.

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

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

As described in the Self-assessment report, the average study period for BCESP students is 4.7 years. About 24 % graduate in less than four years, 44 % graduate after 4 to 4.5 years, and the rest (32 %) needs more than 4.5 years. There are two factors that prolong the studies, namely academic and non-academic constraints. The academic constraint is the Laboratory Research Course (Chemistry Colloquium), which is scheduled to be completed within one semester, but the data collection process in the laboratory and the subsequent data

analysis process often takes much longer, ranging from one to three semesters. Non-academic constraints include the inability of students to manage the research period well so that the time for colloquium completion exceeds the expected.

Almost no students drop out of the BCESP programme due to failing too many courses. However, from 2016 to 2021, there were 37 students, who decided to leave BCESP in order to join a different study programme at UNS or other universities.

The average study period of BBESP students is four years and four months. In detail, 11 % graduated in less than or equal to three years and 10 months in 2019, this number decreased to 4.5 % in 2020. In 2019, the number of students who graduated in more than four years decreased significantly to 44.5 %, but in 2020, it increased again to 68.2 %. This is due to the COVID-19 pandemic, which caused obstacles in the research data gathering and the adaptation to teaching was difficult.

Almost no students drop out of the BBESP programme due to failing too many courses. However, from 2016 to 2021, there were 32 students, who decided to leave BBESP in order to join a different study programme at UNS or other universities.

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

To find out more about the reason why students take longer than the expected four years, UNS conducted a survey. The answers show that the problem is mostly in the eighth semester, when students have to conduct the Bachelor's thesis. In order to support students with finishing their Bachelor's thesis in time, the thesis supervisor is assigned earlier now (sixth semester) so that students have more time for designing their research proposals. The programme coordinators also invite students if they have some problems with finishing their tasks in time in order to discuss with them the reasons and find possible solutions. In addition, some students have non-academic problems (for example personal or financial reasons), which lead to prolonged studies. The peers see that UNS has recognised that it could be a possible solution to the problem of exceeding the intended length of studies, that academic advisors encourage students to accelerate the completion of their final assignments and to start earlier on their research proposal for the Bachelor's thesis.

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

## Criterion 2.3 Teaching methodology

**Evidence:**

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

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

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

Students are further encouraged to apply their knowledge in a series of student projects that are oriented towards teaching practice in the classroom and in laboratories. Classes and laboratories are designed in problem-based learning settings in order to introduce student-oriented teaching methods to involve all students in the learning processes and to develop their thinking and analytical skills. Problem based learning and student centred learning is used in several courses and students are assigned to group projects and have to present their findings in front of the class. In addition, practice-based learning in form of school internships is also part of the curriculum.

The most common method of learning is class session, with several courses having integrated laboratory work. Lecturers generally prepare presentations to support the teaching process. In addition, several courses include teaching practice sessions (i.e. students presenting teaching practice trials in front of their peers). With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods.

In summary, the peer group considers the teaching methods and instruments to be suitable

to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concept of both undergraduate programmes comprise a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

**Criterion 2.4 Support and assistance**

**Evidence:**

- Self-Assessment Reports
- UNS Academic Guidelines
- Discussions during the audit

**Preliminary assessment and analysis of the peers:**
UNS offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is responsible for approximately 10 students from his classes. He/she is a student's first port of call for advice or support on academic or personal matters.

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

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

The fourth-year students who prepare their final project have one or more supervisors, who are selected based on the topic of the final project. One supervisor could be an external supervisor, if the student performs the final project outside UNS. The role of the final project supervisor is to guide students in accomplishing their final project, e.g. to finish their research and complete the final project report.

All students at UNS have access to the digital academic information system (SIAKAD). The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, course list) are available via SIAKAD. In addition, course materials and supporting documents compiled by the lecturers are presented at SPADA, which is the e-learning platform of UNS. Students who have registered for certain courses can access all the materials at SPADA.

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

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

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

The peers support that UNS will add a course in bioinformatics to the BBESP curriculum and will make the course in molecular biology a compulsory one.

The peers confirm that now 1 CSU (1.5 ECTS) are awarded for "Field Study" course in BCESP and that the study plan has been updated accordingly.

With respect to further promoting students' academic mobility, the peers appreciate that UNS has recognised this issue and is planning to better informing students and parents about the existing opportunities and to motivate them to spend some time abroad. In addition, it is planned to collaborate with some universities under the South East Asian Ministry of Education Partnership. The peers support these efforts and recommend to further pursuing this path and to foster academic mobility.

The peers understand the difference between the Indonesian credit point system and ECTS. They expect UNS to ask the students about their actual workload through regular surveys, and then award the ECTS points accordingly. In addition, it needs to be made transparent in all relevant documents that UNS calculates 28 hours of students' total workload per ECTS point.

The peers consider criterion 2 to be mostly fulfilled.

# 3. Exams: System, concept and organisation

**Criterion 3 Exams: System, concept and organisation**

**Evidence:**

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

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

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

The information about the exam system is submitted by each lecturer at the beginning of the course through a "Course Contract", which contains information about the terms of the course (pre-requisites), learning objectives, learning methods, brief descriptions of classes, assignments, references, assessment processes, and passing standards. Exam criteria and requirements & remedial policy are also explained in the contract.

As described in the module descriptions, students' performance is usually assessed by laboratory work/quizzes (30 %), participation (10 %), mid-term exam (20%), and final exam (30 %). Participation includes attendance (minimum of 75 %), asking and answering question, active in a discussion or in an experiment (observation), and performance. Participation and assignment records are managed by each teacher, while mid-term and final exams are managed by the degree programme. The grading system is different for the teaching internships, the community service, and the final project. The details, which assessment forms are used in these courses and how they contribute to the final grade, are described in the respective module descriptions and the course contract.

The most common type of evaluation used are written examinations; however, quizzes, laboratory work, assignments (small projects, reports, etc.), presentations, seminars, and discussions may contribute to the final grade. Written examinations, either closed-book or open-book, typically include short answers, essays, problem-solving or case-based ques-

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

The chemistry colloquium course in BCESP and the biology research course in BBSEP are designed to introduce students to scientific methods and research activities. Students conduct research activities in the laboratories under the guidance of a supervisor, including proposal preparation, implementation of laboratory research, and report preparation. At the beginning of semester 6, when students are taking this course, the study programmes provide briefings on scientific writing materials and latest research materials. The "Chemistry Colloquium" in BCESP and "Research in Biology" in BBESP are conducted in the form of a seminar, where students discuss scientific papers based on laboratory or field studies.

In 7th Semester, students take the thesis course, during which students carry out independent research activities in chemistry education. BCESP organizes a thesis workshop programme, which includes scientific writing, literature research, managing libraries, and rules of good scientific conduct (citation rules and plagiarism). In addition, students are also given the opportunity to take a research internship course (elective) at a research institute.

Student competencies in the Field School Internship (PLP) are assessed by supervisors and tutor teachers from partner schools. The assessment is conducted based on students' competencies in using learning tools, teaching materials, learning media, and assessment instruments. In addition, students are also required to be able to identify learning problems in the classroom and propose solutions. Reports on problem identification and solutions are presented in front of supervisors and tutor teachers. The assessment of the community service consists of a work plan, programme implementation, and activity report.

Every student in the BBESP and BCESP programmes is required to do a final project (Bachelor's thesis). This project is conducted independently under the guidance of one or more supervisors and usually consists of literature study, practical research, and data analysis. Both the student and his /her supervisors might decide the topic and content of the project. In many cases, the lecturers offer particular topics connected to their research. The students have to present their results and defend them in an oral presentation in front of the Thesis Examiner Team, which consist of four persons, namely the chairperson, secretary of examiners, and first and second examiners. The first and second examiners are the students' thesis supervisors.

If a student fails, she or he usually has to repeat the entire module in the following semester; it is usually not possible to retake just parts of the course or to just retake the final

exam. However, mid-term exams can be repeated (remedy) but if a student fails the final exam, she or he has to retake the whole course in the next semester. The absence of students in the midterms and finals due to illness or otherwise is remediable by taking the exam later. Students, who cannot attend practical courses for acceptable reasons, can repeat the practicum later; the lecturers are responsible for the arrangement. Students with special needs are provided with support to enable them to participate in the academic activities and exams. There is a fixed period after the announcement of the final grades, during which students can ask for explanations and can appeal their grades.

During the audit, the peers notice that most of the exams verify the students' knowledge and if they can repeat the learned content. However, the peers are convinced that it would be useful to put more emphasis on questions related to transfer skills and critical thinking. The mid-term and final exams should not only verify if the students have learned the content by heart but if they understand the context and the reasoning behind it and are able to apply the acquired knowledge to new areas. Students should get familiar with international standards in biology and chemistry education and the exams should focus more on problem solving skills. It is also important that, especially in the educational modules, different forms of exam are used, not only written exams.

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

The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. They compliment in particular the high quality of the Bachelor's theses.

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

The peers thank UNS for explaining that in some courses different types of examinations are applied, which have not been described in the previous module handbook. Of course, updating the module descriptions and describing correctly what exams are applied, it necessary. At the same time the peers point out that in all courses there should be more emphasis on questions related to transfer skills and critical thinking in the exams. It is necessary that students not only learn by heart, but also understand the underlying principles and are able to apply them in any given context. For this reason, there should be a stronger focus on competence oriented exams, especially in the educational modules.

The peers consider criterion 3 to be mostly fulfilled.

# 4. Resources

**Criterion 4.1 Staff**

**Evidence:**

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

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

According to the Self-Assessment Report, the teaching staff in BCESP consists of 18 full-time teachers (3 full professors, 7 associate professors, 7 assistant professors, and 3 senior lecturers). Most of the teachers (14) hold a PhD, the rest (4) hold a Master's degree. The teacher to student ratio is 1:17.7.

There are 24 permanent teachers in BBESP (4 full professors, 6 associate professors, 9 assistant professors, and 5 lecturers). 17 teachers hold a PhD and 7 have a Master's degree. The teacher to student ratio is 1:15.

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

The peers positively notice that in both degree programmes several guest lecturers from renowned international universities are invited to give classes and act as keynote speakers in seminars. The purpose of inviting domestic and foreign guest lecturers is to provide students with a different learning experience, and to improve standard of lectures at UNS. In

addition, practitioners and experts from research and industrial institutions give virtual field lectures, webinars, and take part at seminars.

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

During the audit, the peers inquire how high the teaching load is and if are there enough opportunities for the academic staff members to conduct research activities. They learn that teachers at FTTE have a workload of 12 to 16 credits; the national maximum is 16 credits, so that teachers have enough time for all their activities including research. How much time staff members actually devote to research is different from teacher to teacher, because working hours are spent flexibly for teaching, research, and community service.

The peers compliment the research activities in the area of biology and chemistry education at UNS; however, they see that the results of the research activities are hardly known internationally. For this reason, they encourage UNS to better promote publishing scientific papers in internationally recognised scientific journals and to increase the international visibility of educational research activities at UNS. In addition, it would be useful to familiarise students with current research topics. For example, the departments could offer a seminar/lecture series so that students can gain a broader view on research activities in both scientific and educational research.

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

**Criterion 4.2 Staff development**

**Evidence:**

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

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

UNS encourages training of its academic and technical staff for improving the educational abilities and teaching methods. As described in the Self-Assessment Report, faculty members attend courses in English language training, Information and Communications Technology (ICT), laboratory safety and instrumentation, writing publications, and e-learning. Furthermore, Applied Approach (PEKERTI-AA) is a compulsory training for all staff members that focuses on advancing pedagogical knowledge. It is designed particularly for junior faculty members to introduce various teaching methods, learning strategies, preparation of assessments, class management, as well as syllabus and course content development. All teachers at UNS are obligated to attend the lecturer certification programme held by the Directorate General of Higher Education (Direktorat Jenderal Pendidikan Tinggi, DIKTI). An official teaching certificate is issued after the faculty member has completed the certification process. In addition, the study programmes organise trainings to upgrade lecturers' pedagogical content knowledge on a regular basis.

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

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

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at UNS, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars; even a sabbatical leave is possible.

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

## Criterion 4.3 Funds and equipment

**Evidence:**

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

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

The composition of UNS's budget in 2021 was government funds 26 %, tuition fees 42 %, business and non-academic services 15 %, partnership funds from the industry 6 %, interest and provision 1 %, unused funds from the previous year (ending balance) 11 %.

The provided budget allows the departments to conduct the study programmes as well as some specific activities, including student exchange programmes, student financial assistance for research, and participation in international conferences.

The academic staff members emphasise that from their point of view, both undergraduate programmes under review receive sufficient funding for teaching and learning activities. The students confirm this positive impression and state their satisfaction with the available resources.

In advance of the audit, the peer group received videos showing some of the laboratories at the Faculty of Teacher Training and Education. They notice that there are no bottlenecks due to missing equipment or a lacking infrastructure. The technical equipment for teaching the students on a Bachelor's level is available. Moreover, the peers learn during the audit that students can use and operate the instruments in the laboratories by themselves after being trained and instructed by either senior students or lab technicians. Each laboratory has a lab supervisor; in addition, there are several senior students that work as lab assistants.

Nevertheless, it is difficult for the peers to assess the extent of the safety measures based on the videos and the discussions alone. Only some laboratories are shown in the videos and especially the scope and design of the safety standards remain unclear (material and surface quality of the working benches, safety goggles, gloves, eye showers, fire extinguishers, emergency exits, chemical-proof cabinets, first-aid kits, fume hoods, waste management, and ventilation system). For this reason, the peers point out that it is necessary to verify that the safety measures are strictly followed in the labs by all persons and to explain

in detail, what safety measures are in place. The peers understand that students receive safety instructions at the beginning of every laboratory class, but it is also necessary that all persons follow these instructions.

In addition, the teachers point out during the discussion with the peers that some instruments are outdated and need to be replaced and more technical staff for maintaining the instruments would be needed. Moreover, some sophisticated instruments should be available. So far, teachers have to send their samples to other universities or research institutes for analysis, but this takes sometimes very long before they receive the results.

The peer group understands that modern research equipment for sophisticated laboratory work, sufficient in terms of quality and quantity, is not readily available and that the funds are restricted. This is partly compensated by the fact that in addition to the laboratories in the different departments, there is the UNS Central Laboratory, which is used by staff members from all faculties. In the Central Laboratory, some advanced instruments are available and it is possible for teachers and senior students to use the technical equipment upon appointment.

Moreover, the peers emphasise that all students need to have the opportunity to get hands on experience with carrying out laboratory experiments. For this reason, the number of students conducting one experiment should be reduced. In order to gain sufficient practical experience in the laboratories, groups conducting one experiment should not be larger than two to three students.

The students also express their satisfaction with the library and the available literature there. Remote access via VPN is possible and UNS offers access to several scientific digital databases such as ScienceDirect, so that teachers and students access current scientific papers, e-books, and papers. However, they suggest that UNS should improve the digital facilities in the classrooms and establish a smart digital classroom. Form the peers' point of view this is a useful suggestion, because of the rising importance of digital teaching and learning.

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

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

The peers point out that their remark with respect to increasing the research output and the international visibility of UNS mostly concerns the teachers' research activities and not

the students. The focus could be on science education related research topics and the goal should be to publish the results in peer-reviewed international journals.

The peers understand that there are regulations for laboratory safety action and that the laboratory assistants and technicians are responsible for ensuring that all students adhere to the requirements. However, the peers point out that is difficult to judge from videos and reports alone if the safety measures in the laboratories are adequate and are strictly followed or if there are some deficiencies. This issue can be resolved during the planned on-site visit.

The peers appreciate that both study programmes will adjust the number of students in the laboratory to two or three per group and have submitted a budget for improving the quantity and quality of laboratory tools and equipment. The peers expect UNS to provide verification of the implemented changes and the updated and increased laboratory equipment in the further course of the procedure.

With respect to establishing a Smart Digital Classroom, the peers hope that the requested additional funds will be provided by UNS.

The peers consider criterion 4 to be mostly fulfilled.

# 5. Transparency and documentation

**Criterion 5.1 Module descriptions**

**Evidence:**

- Self-Assessment Reports
- Module descriptions
- Homepage UNS: https://uns.ac.id/en/
- Homepage FTTE: https://fkip.uns.ac.id/en/
- Homepage Chemistry Education: https://kimia.fkip.uns.ac.id/
- Homepage Biology Education: https://biologi.fkip.uns.ac.id/en/

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

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

However, they point out that there are discrepancies in the description of the exams between the Self-Assessment Report and the module descriptions. The module descriptions should specify what exams are really applied in the lectures and the practical courses. For this reason, it is necessary to update the module handbook in order to align the forms of exams and the content with what is actually taught and what exams are applied. In addition, inconsistencies between the module descriptions and the study plans, with respect to the semester in which the courses are offered, need to be solved. Finally, diversity of high school students (special needs, different cultural background etc.) should be addressed in the module "Inclusive Education".

### Criterion 5.2 Diploma and Diploma Supplement

**Evidence:**

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

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

### Criterion 5.3 Relevant rules

**Evidence:**

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

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

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

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

The peers confirm that UNS has updated the Diploma Supplements of both degree programmes and has included information on the ECTS points awarded for the degree programme. In addition, UNS has also updated the module descriptions, with respect to the form of exams and the content. The peers are now satisfied with the module descriptions.

The peers consider criterion 5 to be fulfilled.

# 6. Quality management: quality assessment and development

**Evidence:**

- Self-Assessment Reports
- UNS Academic Guidelines
- Discussions during the audit

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

This system relies on internal (SPMI) as well as external (SPME) quality assurance. SPMI encompasses all activities focused on implementing measures for improving the teaching and learning quality at UNS. SPME focuses on both national and international accreditations. Every degree programme and every Higher Education Institution in Indonesia has to be accredited by the national Accreditation Agency (BAN-PT). UNS as an institution as well as both degree programmes under review have received the highest accreditation status (A) from BAN-PT.

Internal assessment of the quality of the degree programmes is mainly provided through student, alumni, and employer surveys. The students give their feedback on the courses by filling out the questionnaire online at the end of each semester. Students assess various aspects such as students' understanding, lecturer's responsiveness, course delivery, lecturer's proficiency, explanation of course objective, and references in each enrolled course. Students' opinion is quantified by means of index 1 (unsatisfactory) to 4 (excellent). Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on the digital platform SIAKAD.

The peers see that the programme coordinators are very open for feedback from the students and that the students' comments are taken into consideration with regard to further developing the degree programmes. This becomes apparent in the constant curricular revision process that is performed under participation of students and alumni. The stakeholders confirm in the discussion with the peers that the UNS is eager to receive feedback about new developments and trends and the employability of their graduates.

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

In addition, each department regularly conducts an alumni tracer study. By taking part at this survey, alumni can comment on their educational experiences at UNS, the waiting period for employment after graduation, their professional career and can give suggestions how to improve the programme. Furthermore, there is the Career Development Centre at UNS, which offers help to find suitable internships, announces job vacancies, organises job fairs, and offers courses to develop soft skills.

The auditors gain the impression that the departments take the students' feedback seriously and changes are made if necessary. In case of negative feedback, the Head of Department talks to the respective teacher, analyses the problem, and offers guidance. There are regular meetings (every semester) with students where they can voice their issues and suggestions. During these meetings, students are also informed about the results of the students' satisfaction surveys.

Nevertheless, the peers see that students are only represented in the university's board of trustees but not in any other board on faculty or department level. Thus, students are not directly involved in the decision-making processes. The peers are convinced that it would be very useful to have student members in the different boards. For this reason, they recommend that student representatives should be members of the boards at UNS at least on

department and faculty level and be actively involved in the decision-making processes for further developing the degree programmes.

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

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

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

The peers appreciate that UNS has already followed their suggestion on establishing an advisory board with external stakeholders, alumni, and students in both degree programmes.

The peers consider criterion 6 to be mostly fulfilled.

# D Additional Documents

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

- none

# E Comment of the Higher Education Institution (25.03.2022)

UNS provides the following statement:

**1. Criteria 1.3: International Class**

The BBESP plan to start the bilingual class next semester (August 2022). The survey about students' perspectives on this issue was done a couple weeks after the ASIIN accreditation day, and around 30 students agreed to join the bilingual class. As feedback, we have run the preparation for this semester (March-July 2022). The preparation includes assigning some courses to deliver the materials in English or bilingual, and 30 students are encouraged to write tasks and do presentations in English.

**2. Criteria 2.1. BBESP Modern Biology Courses**

BBESP will add new courses, i.e., Bioinformatics (3 CSU) at semester 7th, and change the status of Molecular Biology (2 CSU) course from the elective course to compulsory one. The official changes will be done in the next curriculum reconstruction or evaluation.

**3. Criteria 2.1. BCESP Field Study**

We add 1 CSU (1.5 ECTS) to the Field Study course. It will be provided in the study plan (revised-module handbook), and accommodates industrial exposure in the form of excursions.

**4. Criteria 2.1. International Mobility**

BBESP have two annual international summer schools. In 2006 and 2019, BBESP had also conducted a Birdwatching Competition. The participants were about 250 birdwatchers (students, researchers, and commoners) from around Indonesia, three experts from Universiti Kebangsaan Malaysia and one from National Changhua University of Education also joined. This event was funded by the National Park of KGPAA Mangkunegoro I (Ngargoyoso) Central Java and UNS.

The Summer School of Biodiversity of Primates in Java has been run since 2021, and totally funded by the UNS World Class University Grant. The course has been run virtually due to the pandemic of Covid-19.

It was planned to run the International summer course physically in 2022.

The information of summer course will be promoted to some universities overseas through the international office of UNS

BBESP and BCESP plan to redesign our strategies to prepare our students to improve the number of students who join for international student mobility.

Some of our strategies are:

● Surveying the English proficiencies of students, and based on the data, we will group them.

● Introducing the international program with students' parents. The international activities need financial support from the university, alumni and stakeholders, including parents. We plan to have an initial meeting with the parents of new students in the coming academic year, and get them to acknowledge this issue earlier.

● The special group/class that we call an international class will be prepared and trained for international activities that students are interested in. Some training topics are not only language, but also mental readiness, motivation, preparing the proposal, doing interviews, and pre-departure training.

● To improve the number of international activities offered to students, we also will collaborate with some universities under the South East Asian Ministry of Education Partnership.

● Both of the study programs have a team for student support on internalisation, and we will put more concern on the task of this team.

**5. Criteria 2.2. Students Workload and Credits**

UNS has released the new guidance for UNS curriculum on August 1st, 2020 (Conversion Guidance is attached), and in that guidance, there is a regulation on conversion of CSU to ECTS. According to this regulation, 1 ECTS equal to 0.67 CSU or 1 CSU equal to 1.5 ECTS. 1 CSU means 50 minutes face to face /week/semester or equal to 75 minutes in ECTS. For structured tasks, 60 minutes/week/semester or equal to 90 minutes/week/ semester in ECTS; 60 minutes/week/semester for self-study equal to 90 minutes/week/semester in ECTS.

In case the course is done by doing a seminar or other types (conference), then the workload of students is 150 minutes/week/semester for face-to-face meeting, and 105 minutes/week/semester for self-study.

For the practicum, field study, workshop, internship, student mobility or other MBMK's activities, the workload is 170 minutes or equal to 255 minutes ECTS.

The real workload of students will be mapped through regular surveys, and will be the basis for next curriculum reconstruction.

Based on the new conversion system we have recalculated our ECTS-based curriculum and make revision in the current module handbook by considering the type of activities which is related to the student workload

We have updated our Module Handbook by considering changes in examination format description which are relevant to the content. And we also have revised the study plan in order to match with the Module Handbook.

**6. Criteria 3. Exam System**

Actually, some courses have applied different types of examination to measure the students' achievement, but have not been described in the previous Module Handbook. We revised our Module Handbook by putting additional descriptions on the course activities, workload of students to accomplish the module in one semester, the format of examination, and example of examination, including the problem solving and critical thinking-based assessment.

**7. Criteria 4.1. International Publications of Students Thesis**

There is a regulation of UNS about the research publication of undergraduates. The students are encouraged to submit their articles (as the results of the final thesis) to at least national accreditation journals. The national accreditation system of academic journals in Indonesia is regulated by the Ministry of Education, Culture, Research and Technology (https://sinta.kemdikbud.go.id/journals). Based on those rules, articles of undergraduate students of BBESP and BCESP are usually submitted to some accredited national journals and also presented in some international conferences with the Scopus-indexed proceedings.

To make the thesis-based publications internationally known, we actually have tried to encourage each student-under supervision of the thesis advisor to submit the article in the national accredited journal. And this program has been run very well. However, the national journal seems not to be internationally known because most of the journals are in Indonesian Language. Some with English have been cited by some scholars. To be more widespread internationally, both study programs agreed to have regular International scientific writing workshops for students and lecturers in each semester to train them for writing an international-level paper.

We also plan to have a co-courses for students to strengthen research methodology and publication skills, and current research topics in education.

We also encourage students/lecturers to present their papers in our biennial ICoSMEE (International Conference on Science, Mathematics, Education and Environment), annual ICOSETH (International Conference on Science Education and Technology), ICTTE (International Conference on Teacher Training and Education), and other international conferences in Indonesia and overseas, in which the publications are targeted to the Scopus-Indexed Proceeding.

The publication charges will be supported by the grant from the research and community development Institute (LPPM) of UNS.

**8. Criteria 4.3. Safety Lab**

Both study programs have the Operational Standard Procedure (SOP) for laboratory safety action. The SOP has been internalised to students, lecturers and staff. To ensure that the students do not only understand the instructions but also strictly follow it, in each laboratory activity there are practicum assistants who are selected from senior students, and also laboratory technicians who have responsibility on keeping the rules obeyed by the student. The SOP of Laboratory safety for both study programs can be accessed in the website of each study program, and we also attached the documents.

**9. Criteria 4.3. Laboratory equipment and practical experiences**

The current situation of our laboratory equipment is adequate enough for doing practicum for teacher training.

In addition, to respond to the issue of guaranteeing the practical experiences of each student, both study programs will adjust the number of students in the practicum group to two or three students per group, by rescheduling the shift of practicum.

Both Study Programs have also submitted the budget for improving the quantity and quality of laboratory tools and equipment in the current fiscal year.

**10. Criteria 4.3. Equipment-Smart Digital Classroom**

Classrooms in both study programs have been equipped with LCD Projectors. During the pandemics, the classrooms have been installed with video apparatus, because the lectures are conducted hybrid. We also have two microteaching rooms to accommodate the teaching demo/teaching practice in the mini class. We have put the figure of microteaching rooms in our previous submitted video to ASIIN.

For the better quality of those rooms, we proposed the budget to the university management to install the smart- digital classroom using two available rooms in the D building.

**11. Criteria 5.1. Diploma Supplement**

We have added the ECTS conversion in the Diploma Supplement. Examples of diploma supplements have been uploaded on the website of BBESP and BCESP.

**12. Criteria 6. Advisory Board**

We appreciate the idea of the Advisory Board as excellent. We have discussed this issue with faculty members and faculty coordinators as soon as the days of visitation, and we also talked with our stakeholders and alumnae of this issues. Finally, we decided to establish the board at the study program level, and we named it the Study Program Committee.

Both BBESP and BCESP actually have an alumni association and students board. We regularly contact them to contribute to our program. In our new organisational structure, we put a new board or committee that consists of the representatives of students, alumni, and stakeholders.

# F Summary: Peer recommendations (07.04.2022)

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ba Biology Education | With requirements for one year | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |

## Requirements

**For all degree programmes**

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

A 2. (ASIIN 2.2) It needs to be made transparent in all relevant documents that UNS calculates 28 hours of students' total workload per ECTS point.

A 3. (ASIIN 4.3) Make sure that the safety measures are strictly followed in the labs.

A 4. (ASIIN 4.3) It is necessary to update and increase the technical equipment in the laboratories so that experiments, especially in chemistry/biology education, can be done by groups not larger than two to three students.

## Recommendations

**For all degree programmes**

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

E 2. (ASIIN 3) It is recommended to put more emphasis on competence oriented exams, especially in the educational modules.

E 3. (ASIIN 4.3) It is recommended to increase the international visibility of educational research activities at UNS.

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

# G Comment of the Technical Committees (13.06.2022)

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

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

The Technical Committee discusses the procedure and proposes to ask the Indonesian student involved in the procedure to look at the safety standards on site and to check whether they are consistently observed.

The requirements and recommendations are approved.

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ba Biology Education | With requirements for one year | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |

## Technical Committee 10 – Life Sciences (13.06.2022)

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

The Technical Committee discusses the procedure and approves the proposed requirements and recommendations.

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ba Biology Education | With requirements for one year | - | 30.09.2027 |

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |

# H Decision of the Accreditation Commission (24.06.2022)

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

The Accreditation Commission discusses the procedures and agree with the proposed requirements and recommendations.

The Accreditation Commission decides to award the following seals:

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ba Biology Education | With requirements for one year | - | 30.09.2027 |
| Ba Chemistry Education | With requirements for one year | - | 30.09.2027 |

## Requirements

**For all degree programmes**

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

A 2. (ASIIN 2.2) It needs to be made transparent in all relevant documents that UNS calculates 28 hours of students' total workload per ECTS point.

A 3. (ASIIN 4.3) Make sure that the safety measures are strictly followed in the labs.

A 4. (ASIIN 4.3) It is necessary to update and increase the technical equipment in the laboratories so that experiments, especially in chemistry/biology education, can be done by groups not larger than two to three students.

## Recommendations

**For all degree programmes**

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

E 2. (ASIIN 3) It is recommended to put more emphasis on competence oriented exams, especially in the educational modules.

E 3. (ASIIN 4.3) It is recommended to increase the international visibility of educational research activities at UNS.

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

# I Fulfilment of Requirements (23.06.2023)

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

### Requirements

**For all programmes**

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

| **Initial Treatment** | |
|---|---|
| Peers | Fulfilled<br>Vote: unanimous<br>Justification: UNS has verified the students' total workload and adjusted the ECTS points. This is based on the detailed explanation provided in the "Student Workload Verification" section and the "Report of Student's Workload Survey". |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the peers' assessment. |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: Technical Committee agrees with the peers' assessment. |

A 2. (ASIIN 2.2) It needs to be made transparent in all relevant documents that UNS calculates 28 hours of students' total workload per ECTS point.

| **Initial Treatment** | |
|---|---|
| Peers | Fulfilled<br>Vote: unanimous<br>Justification: UNS has revised the module handbooks, student handbooks, and curriculum documents accordingly. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the peers' assessment. |
| TC 10 | Fulfilled<br>Vote: unanimous |

| | |
|---|---|
| | Justification: Technical Committee agrees with the peers' assessment. |

A 3. (ASIIN 4.3) Make sure that the safety measures are strictly followed in the labs.

| **Initial Treatment** | |
|---|---|
| Peers | Fulfilled<br>Vote: unanimous<br>Justification: Both BBE and BCE degree programmes assigned an OSHE (Occupational Safety, Health, and Environment) team that will do the audit and present reports. BCE even provides training for its member and has formed an emergency response team. |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the peers' assessment. |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: Technical Committee agrees with the peers' assessment. |

A 4. (ASIIN 4.3) It is necessary to update and increase the technical equipment in the laboratories so that experiments, especially in chemistry/biology education, can be done by groups not larger than two to three students.

| **Initial Treatment** | |
|---|---|
| Peers | Fulfilled<br>Vote: unanimous<br>Justification: Both BBE and BCE degree program have done some adjustment of the number of students in each practicum group (BBE: from 4 to 3 and BCE from 3 to 2). There are also laboratories renovations and additional equipment, tools, and apparatus for the laboratory (with some pictures provided). |
| TC 09 | Fulfilled<br>Vote: unanimous<br>Justification: The TC follows the peers' assessment. |
| TC 10 | Fulfilled<br>Vote: unanimous<br>Justification: Technical Committee agrees with the peers' assessment. |

# Decision of the Accreditation Commission (23.06.2023)

The AC decides that all requirements are fulfilled.

The Accreditation Commission decides to award the following seals:

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

# Appendix: Programme Learning Outcomes and Curricula

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

| | |
|---|---|
| | **Specialist Competence (Knowledge, Specific Skills)** |
| PLO1 | They are able to demonstrate their knowledge of fundamental science and mathematics and relates to biological problems |
| PLO2 | They are able to apply the knowledge on basic and advanced biology to solve the problem in biology |
| PLO3 | They are able to analyse, evaluate, design and implement the lesson plan, and counselling program based on pedagogical knowledge |
| PLO4 | They are able to demonstrate the research methodology in biology and its teaching and learning and publish the results of the research |
| PLO5 | They are able to select and analyse the proper technology and information or data in accomplishing regular tasks |
| PLO6 | They are able to demonstrate laboratory works, design and implement the experiment based on laboratory knowledge, skills, safety, environmental issue, and social ethics problem |
| | **Social Competencies (General skills and Attitudes)** |
| PLO7 | They are able to solve problem and present the idea argumentatively |
| PLO8 | They are able to communicate verbal and non verbal effectively using the proper communication media |
| PLO9 | They are able to apply the managerial and leadership principles in the field work and work in a multi discipline and multi cultural team |
| PLO10 | They are able to demonstrate creativity, accuracy, discipline, responsibility, adaptability, have an independent initiative, autonomous learning, and do lifelong learning |

The following **curriculum** is presented:

| NO | COURSE CODES | COURSES | CREDITS | ECTS | ACTIVITIES | |
|---|---|---|---|---|---|---|
| | | | | | T | P |
| | | **SEMESTER I** | | | | |
| 1 | KB1818103 | Educational Sciences | 2 | 3.24 | 2 | |
| 2 | KK1820176 | Plant Anatomy and Morphology | 3 | 4.86 | 2 | 1 |
| 3 | KB1811119 | Cellular Biology | 2 | 3.24 | 2 | |
| 4 | KB1811109 | General Biology | 2 | 3.24 | 2 | |
| 5 | KB1818101 | Environmental Science | 2 | 3.24 | 2 | |
| 6 | PK1812103 | Indonesian Language | 2 | 3.24 | 2 | |
| 7 | PK1818104 | Civics Education | 2 | 3.24 | 2 | |
| 8 | PK1811102 | Religious Education | 2 | 3.24 | 2 | |
| 9 | PK1811101 | English For Academic Purposes | 0 | 0 | 2 | |
| 10 | PK1812101 | Pancasila | 2 | 3.24 | 2 | |
| 11 | KK1818203 | Inclusive Education | 2 | 3.24 | 2 | |
| | | Total Credits | **21** | **34.02** | | |
| | | **SEMESTER II** | | | | |
| 1 | KB1818200 | Biochemistry | 3 | 4.86 | 2 | 1 |
| 2 | KB1814202 | Cryptogams Diversity and Classification | 3 | 4.86 | 2 | 1 |
| 3 | KB1814204 | Invertebrate Diversity and Classification | 3 | 4.86 | 2 | 1 |
| 4 | KK1811202 | Learners Development | 2 | 3.24 | 2 | |
| 5 | KB1820295 | Digital Class Management | 2 | 3.24 | 2 | |
| 6 | KB1816103 | Basics of Scientific Writing | 2 | 3.24 | 2 | 1 |
| 7 | KB1812452 | High School Biology Curriculum Analysis | 2 | 3.24 | 2 | |
| 8 | KB1820251 | Introduction to Science and Mathematics | 2 | 3.24 | 2 | |
| | | **Total Credits** | **19** | **30.78** | | |
| | | | | | | |
| | | **SEMESTER III** | | | | |

| NO | COURSE CODES | COURSES | CREDITS | ECTS | ACTIVITIES | |
|---|---|---|---|---|---|---|
| | | | | | T | P |
| 1 | KB1816301 | Biology Learning Strategy | 2 | 3.24 | 2 | |
| 2 | KB1812314 | Phanerogams Diversity and Classification | 3 | 4.86 | 2 | 1 |
| 3 | KB1812310 | Vertebrate Diversity and Classification | 3 | 4.86 | 2 | 1 |
| 4 | KB1820340 | Animal Anatomy and Histology | 3 | 4.86 | 2 | 1 |
| 5 | KB1816335 | Microbiology | 3 | 4.86 | 2 | 1 |
| 6 | KB1820380 | Biostatistics | 2 | 3.24 | 2 | 1 |
| 7 | KB1814332 | Biotechnology | 2 | 3.24 | 2 | 1 |
| 8 | PB1811302 | Guidance and Counselling | 2 | 3.24 | 2 | |
| 9 | | Elective Courses | 2 | 3.24 | 2 | |
| 10 | | Elective Courses | 2 | 3.24 | 2 | |
| | | **Total Credits** | 24 | **38.88** | | |
| | | | | | | |
| | | **SEMESTER IV** | | | | |
| 1 | PB1820400 | Learning Media and Resources | 2 | 3.24 | 2 | |
| 2 | PB1816402 | Biology Learning Evaluation | 2 | 3.24 | 2 | |
| 3 | KB1817511 | Microtechniques | 2 | 3.24 | 2 | 1 |
| 4 | KB1812424 | Human Anatomy and Physiology | 3 | 4.86 | 2 | 1 |
| 5 | PB1820499 | Bio-conservation | 2 | 3.24 | 2 | 1 |
| 6 | KB1811544 | Plant Physiology | 3 | 4.86 | 2 | 1 |
| 7 | KB1811806 | Genetics | 3 | 4.86 | 2 | 1 |
| 9 | KB1811753 | Evolution | 2 | 3.24 | 2 | |
| 10 | | Elective Courses | 2 | 3.24 | 2 | |
| 11 | | Elective Courses | 2 | 3.24 | 2 | |
| | | **Total Credits** | **23** | **37.26** | | |
| | | | | | | |
| | | **SEMESTER V** | | | | |
| 1 | KB1820509 | Ecology | 3 | 4.86 | 2 | 1 |

| NO | COURSE CODES | COURSES | CREDITS | ECTS | ACTIVITIES | |
|---|---|---|---|---|---|---|
| | | | | | T | P |
| 2 | PB1814503 | Biology Lesson Planning | 3 | 4.86 | 2 | 1 |
| 3 | KB1812517 | Animal Physiology | 3 | 4.86 | 2 | 1 |
| 4 | KB1820506 | Animal Embryology and Development | 3 | 4.86 | 2 | 1 |
| 5 | KB1818224 | English for Biology | 2 | 3.24 | | |
| 6 | PK1818506 | Entrepreneurship | 2 | 3.24 | | |
| 7 | KB1816502 | Plant Tissue Culture | 3 | 4.86 | | |
| 8 | | Elective Course | 2 | 3.24 | | |
| | | **Total Credits** | **21** | **34.02** | | |
| | | | | | | |
| | | **SEMESTER VI** | | | | |
| 1 | KB1812625 | Research on Biology Education | 3 | 4.86 | 2 | |
| 2 | PB18186122 | Research on Biology | 3 | 4.86 | 2 | 1 |
| 3 | KB1820507 | Plant Embryology and Reproduction | 3 | 4.86 | 2 | 1 |
| 4 | BB1812501 | Microteaching | 2 | 3.24 | | 1 |
| 5 | | Elective Course | 2 | 3.24 | 2 | |
| 6 | | Elective Course | 2 | 3.24 | 2 | |
| 7 | | Elective Course | 2 | 3.24 | 2 | |
| 8 | | Elective Course | 2 | 3.24 | 2 | |
| 9 | | Elective Course | 2 | 3.24 | 2 | |
| 10 | | Elective Course | 2 | 3.24 | 2 | |
| | | **Total Credits** | **23** | **37.26** | | |
| | | | | | | |
| | | **SEMESTER VII** | | | | |
| 1 | BB1812701 | Community Services (KKN) **(compulsory)** | 2 | 3.24 | | 1 |
| 2 | KB1820812 | *Thesis* I (proposal) | 2 | 3.24 | | 1 |
| 3 | KB1811847 | School Internship **(compulsory)** | 6 | 9.72 | 2 | 1 |
| 4 | BB1820710 | Research Internship (elective)* | 6 | 9.72 | | 1 |
| **5** | BB1820755 | Humanitarian Program(elective)* | 2 | 3.24 | | 1 |

| NO | COURSE CODES | COURSES | CREDITS | ECTS | ACTIVITIES | |
|---|---|---|---|---|---|---|
| | | | | | T | P |
| **6** | BB1820718 | Independent Project(elective)* | 2 | 3.24 | | 1 |
| **7** | BB1820713 | Professional Internship (including recognition of Entrepreneurship Course) (elective)* | 6 | 9.72 | | 1 |
| **8** | BB1820717 | Entrepreneurship Project (elective)* | 6 | 9.72 | | 1 |
| 9 | BB1820719 | National Defence Training (elective)* | 2 | 3.24 | | 1 |
| | | **Total Credits** | **10** | **16.2** | | |
| | | | | | | |
| | | **SEMESTER VIII** | | | | |
| 1 | KB1820812 | *Thesis* II (Research and Examination) | 4 | 6.48 | | |
| | | **Total Credits** | **4** | **6.48** | | |
| | | **Sum of Total Credits** | **145** | **234.9** | | |

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

| **Specialist Competences** | |
|---|---|
| | **Knowledge** |
| PLO1 | Demonstrate comprehensive knowledge in mathematics and natural sciences relevant to chemistry and theoretical concepts and principles of the core subject of chemistry, including inorganic, organic, physical, analytical and biochemistry with its applications. |
| PLO2 | Apply knowledge in theoretical concepts of pedagogy and education including education science, student development, digital classroom management, inclusive education, and counselling. |
| PLO3 | Have ability to operate knowledge about the principles of K3 (health, safety, and security), laboratory management, and environmental issues and the legal fundamentals. |
| PLO4 | Have sound knowledge of basics scientific methods and uses of information and communication technology (ICT), for researches and/or entrepreneurship in the fields of chemistry and chemistry education. |
| | **Technical /Special Skills** |
| PLO5 | Are able to plan, implement and evaluate chemistry learning in a guided manner by utilizing a variety of learning resources and media based on science, technology, and art according to standards of content, process, and assessment, therefore, students improve their 21st-century skills. |
| PLO6 | Are able to carry out practical chemistry work and handle chemicals in the laboratory safely for learning in a guided manner, obtaining research data independently, and entrepreneurship in the field of chemistry. |
| PLO7 | Are able to solve problems in chemistry and chemistry education through research with the correct methodology in a guided manner and present the results. |
| PLO8 | Are able to identify and choose several strategic decisions based on the analysis of information and data in the implementation of chemistry-based/chemistry learning-based entrepreneurship. |

| | |
|---|---|
| **Social Competences** | |
| | **General Skills** |
| PLO9 | Are able to communicate effectively from logical, critical, systematic, and innovative thinking processes in applying science and technology to global and cultured social life and show independent, quality, and measurable performance by paying attention to scientific ethics, and are prepared to enter the professional life as a Bachelor of Chemistry Education. |
| PLO10 | Able to make strategic and responsible decisions based on analysis of information and data, as well as maintaining and developing network with related parties both inside and outside the institution. |
| PLO11 | Able to document, store, secure and rediscover data for the self-evaluation process in order to ensure validity, prevent plagiarism, and accountability for the achievement of the results of one's work or work group. |
| | |
| | **Attitude** |
| PLO12 | Demonstrate an attitude of devoted to God Almighty with religion, upholding human values based on morals and ethics, as well as responsibilities as good citizens based on Pancasila by respecting differences, caring for society and environment, obeying the law, and contributing to improve the quality of social life and the state based on the profession in the field of chemistry and chemistry education. |
| PLO13 | Promote self-development based on a field of expertise independently and sustainably by internalizing values, norms, academic ethics, professional responsibility, struggle, and entrepreneurship, as well as life skills. |

The following **curriculum** is presented

| No | COURSE | Course Codes | Load (credits) | Course (credits) | Seminar (credits) | Practicum (credit) | Course (ECTS) | Seminar (ECTS) | Practicum (ECTS) | Load (ECTS) |
|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) = (5) *1.07 | (9) = (6) | (10) = (7) * 1.65 | (11) = (8) + (9) + (10) |
| **Semester 1** | | | | | | | | | | |
| 1 | BASIC CHEMISTRY 1 | KB1916101 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 2 | PRACTICUM OF BASIC CHEMISTRY 1 | KB1916102 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 3 | MATHEMATICAL CHEMISTRY | KB1918101 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 4 | EDUCATIONAL SCIENCE | KK1918101 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 5 | INDONESIAN LANGUAGE | PK1911102 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 6 | ENGLISH FOR ACADEMIC PURPOSES | PK1911103 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 7 | STUDENT DEVELOPMENT | KK1918102 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 8 | ENVIRONMENTAL SCIENCE | KB1920101 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 9 | PANCASILA EDUCATION | PK1916101 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 10 | ENTREPRENEURSHIP | PK1912103 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| | Total | | 20 | 19 | | 1 | 30.78 | | 1.62 | 32.4 |
| **Semester 2** | | | | | | | | | | |
| 1 | ENGLISH FOR CHEMISTRY | KB1911209 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 2 | BASIC CHEMISTRY 2 | KB1916203 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 3 | BASIC CHEMISTRY PRACTICUM 2 | KB1916204 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 4 | STATISTICS | KB1918202 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 5 | INORGANIC CHEMISTRY 1 | KB1914206 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 6 | LABORATORY MANAGEMENT | KB1918203 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 7 | RELIGIOUS EDUCATION | PK1912204 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 8 | CIVICS EDUCATION | PK1912205 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 9 | INCLUSIVE EDUCATION | KK1920202 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 10 | GUIDANCE AND COUNSELING | KK1920203 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 11 | TECHNOLOGY AND CODING FOR CHEMISTRY | KB1920204 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| | Total | | 23 | 22 | | 1 | 35,64 | 0 | 1,62 | 37.26 |

| Semester 3 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | TEACHING AND LEARNING STRATEGY | PB1911301 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 2 | BASIC ANALYTICAL CHEMISTRY | KB1916306 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 3 | BASIC ANALYTICAL CHEMISTRY PRACTICUM | KB1916307 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| 4 | ORGANIC CHEMISTRY 1 | KB1911321 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 5 | ORGANIC CHEMISTRY PRACTICUM 1 | KB1911322 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 6 | PHYSICAL CHEMISTRY | KB1911324 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 7 | INORGANIC CHEMISTRY 2 | KB1916308 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 8 | INORGANIC CHEMISTRY PRACTICUM | KB1916309 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 9 | CHEMICAL BOND | KB1920305 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 10 | CAPITA SELECTA ON HIGH SCHOOL CHEMISTRY | KB1920306 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 11 | EVALUATION OF LEARNING PROCESS AND OUTCOMES | KB1916310 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| | Total | | 23 | 19 | | 4 | 30.78 | 0 | 6.48 | 37.26 |

| Semester 4 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DIGITAL CLASSROOM MANAGEMENT | KK1920407 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 2 | LESSON PLANNING | PB1918401 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 3 | CAPITA SELECTA ON VOCATIONAL HIGH SCHOOL CHEMISTRY | KB1920408 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 4 | SPECTROPHOTOMETRY | KB1916411 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 5 | SPECTROPHOTOMETRY PRACTICUM | KB1916412 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 6 | ORGANIC CHEMISTRY 2 | KB1911429 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 7 | ORGANIC CHEMISTRY PRACTICUM 2 | KB1911430 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 8 | PHYSICAL CHEMISTRY 2 | KB1911433 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 9 | PHYSICAL CHEMISTRY PRACTICUM | KB1916413 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 10 | BIOCHEMISTRY 1 | KB1920409 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 11 | BIOCHEMISTRY PRACTICUM | KB1920410 | 1 | 1 | | | 1.62 | 0 | 0.00 | 1.62 |
| | Total | | 22 | 19 | | 3 | 30.78 | 0 | 4.86 | 35.64 |

| Semester 5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | RESEARCH METHODOLOGY | PB1916504 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 2 | CHROMATOGRAPHY AND ELECTROMETRY | KB1916514 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 3 | CHROMATOGRAPHY AND ELECTROMETRY PRACTICUM | KB1916515 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 4 | BIOCHEMISTRY 2 | KB1920511 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 5 | CHEMISTRY WORKS | KB1920512 | 2 | 1 | | 1 | 1.62 | 0 | 1.62 | 1.62 |
| 6 | ELEMENTAL CHEMISTRY | KB1916517 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 7 | ELEMENTAL CHEMISTRY PRACTICUM | KB1916518 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 8 | CHEMICAL KINETICS | KB1916519 | 3 | 3 | | | 4.86 | 0 | 0.00 | 4.86 |
| 9 | CHEMICAL KINETICS PRACTICUM | KB1916520 | 1 | | | 1 | 0.00 | 0 | 1.62 | 1.62 |
| 10 | STEREOCHEMISTRY AND ORGANIC REACTION MECHANISMS | KB1914516 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| | Total | | 22 | 18 | | 4 | 29.16 | 0 | 6.48 | 35.64 |
| Semester 6 | | | | | | | | | | |
| 1 | MICRO TEACHING | BB1911601 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| 2 | ENVIRONMENTAL CHEMISTRY | KB1911656 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 3 | CHEMICAL PRODUCT BUSINESS AND EDUCATION | KB1916623 | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 4 | STRUCTURE ELUCIDATION AND ORGANIC COMPOUNDS | KB1914617 | 2 | 2 | | | 3.24 | 0 | 0.00 | 4.86 |
| 5 | RESEARCH IN CHEMISTRY | KB1920613 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| 6 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 7 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 8 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 9 | Field Study | BB1920614 | 0 | | | | | | | 0 |
| | Total | | 16 | 12 | | 4 | 19.44 | 0 | 6.48 | 25.92 |

| Semester 7 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | COMMUNITY SERVICES | BB1912701 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| 2 | SCHOOL INTERNSHIP (PLP) | KK1918704 | 4 | | | 4 | 0.00 | 0 | 6.48 | 6.48 |
| 3 | COLLOQUIUM | KB1920715 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| 4 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 5 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 6 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 7 | Elective | | 2 | 2 | | | 3.24 | 0 | 0.00 | 3.24 |
| 8 | *THESIS* 1 | KB1920716 | 2 | | | 2 | 0.00 | 0 | 3.24 | 3.24 |
| | Total | | 18 | 8 | | 10 | 12.96 | 0 | 16.2 | 29.16 |
| Semester 8 | | | | | | | | | | |
| 1 | *THESIS* 2 | KB1920817 | 4 | | | 4 | 0.00 | 0 | 6.48 | 6.48 |
| | Total | | 4 | | | 4 | 0 | 0 | 6.48 | 6.48 |
| | Total credits of Semester I to VIII | | 148 | | | | | | | 239.76 |