ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Physics Education
Informatics Education

Provided by
Universitas Sebelas Maret

Version: 23.09.2022

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Pendidikan Fisika	Bachelor's degree programme in Physics Education	ASIIN	/	13
Pendidikan Informatika dan Komputer	Bachelor's degree programme in Informatics Education	ASIIN	/	04
Date of the contract: 15.07.2021 **Submission of the final version of the self-assessment report:** 01.03.2022 **Date of the onsite visit:** 17.-19.05.2022 **By videoconference**				
Peer panel: Prof. Dr. Andreas Schwill, University of Potsdam Prof. Dr. Heribert Vollmer, University of Hannover Dr. Angela Fösel, University of Erlangen René Schulz, Spree-Neiße Comprehensive School Felix Cahyadi, Student at Institut Teknologi Bandunge University				
Representative of the ASIIN headquarter: Daniel Seegers				

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1 ASIIN Seal for degree programmes.
2 TC: Technical Committee for the following subject areas: TC 04 - Informatics; TC 13 - Physics.

Responsible decision-making committee: Accreditation Commission	
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of **Technical Committee 04 – Informatics/Computer Science as of March 29, 2018** Subject-Specific Criteria of **Technical Committee 13 – Physics as of March 20, 2020**	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	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
Physics Education	Sarjana Pendidikan (S.Pd.)/Bachelor of Education	/	6	Full time	/	8 semesters	144 SKS (around 216 ECTS)	Yearly, 1984
Informatics Education	Sarjana Pendidikan (S.Pd.)/Bachelor of Education	/	6	Full time	/	8 semesters	144 SKS (around 217,5 ECTS)	Yearly, 2012

For the **Bachelor's degree programme Physics Education** the institution has presented the following profile in the self-assessment report:

"The BPE Study Program has a vision to become the development center of science and technology in the field of Physics Education with international reputation. Further, the missions of the study program are to:

1) organizing education and teaching to produce graduates of Bachelor of Physics Education with a global perspective view;

2) conducting research and development of physics science and learning and published it at the national and/or international level;

3) conducting community service activities as the implementation of the field of science."

For the **Bachelor's degree programme Informatics Education** the institution has presented the following profile in the self-assessment report:

"The BIE Study Program aims to produce graduates who are ready to become experts in the field of Informatics and Computer Engineering Education. The BIE Study Program has a vision to become a superior and innovative center for education, research and training at

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3 EQF = The European Qualifications Framework for lifelong learning

the international level in the field of vocational education in informatics and computer engineering based on the noble values of national culture. The missions of the study program are to

1) Organizing education, training and guidance effectively to produce superior and innovative educators, highly competitive, independent and with good personality in the field of information technology and computers based on the latest developments in science and technology;

2) Organizing research and development activities as an effort to improve the progress of science and technology, especially in the field of information technology and computer engineering;

3) Organizing community service activities as a form of sensitivity and concern in social life;

4) Developing cooperation with domestic and foreign institutions in the field of vocational training."

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report

- Study plans of the degree programmes

- Module descriptions

- Webpage Ba Physics Education: https://physicsedu.fkip.uns.ac.id

- Webpage Ba Informatics Education: https://ptik.fkip.uns.ac.id

- Discussions during the audit

Preliminary assessment and analysis of the peers:

UNS has described and published programme educational objectives (PEO) and programme learning outcomes (PLO) for both degree programmes. While the PEO are developed based on the vision and mission of the university as well as the respective faculty and are rather general, the PLO describe in detail the competences, which the students should acquire during their studies. By means of being published on the websites of the degree programmes, the PEO and PLO are easily accessible for students as well as other stakeholders. Furthermore, there are regular revision processes in place that take into account feedback by employers and alumni. In line with national regulations, a major revision of the curricula including consultations of stakeholders takes place every five years.

The peers base their assessment on the learning outcomes as detailed in the Self-Assessment Report of the two Bachelor's degree programmes under review. They refer to the Subject-Specific Criteria (SSC) of the Technical Committees Physics and Informatics as a basis for judging whether the intended learning outcomes of the programmes as defined by UNS correspond with the competences as outlined by the SSC. They come to the following conclusions:

The learning outcomes of both programmes contain the general aspects that graduates should be able to communicate effectively, to work in teams, to act ethically and responsibly and to be committed to lifelong learning. Beyond that, they encompass specific competences for each of the two programmes.

The goal of the <u>Bachelor's degree programme Physics Education</u> (BPE) is to impart fundamental competences in classical and modern physics paired with skills such as designing curricula and to lay out and implement teaching and learning activities by employing a variety of instruction and assessment strategies and methods. Graduates should be able to understand, formulate and solve basic problems in physics by applying the relevant mathematical, computational, and experimental methods. They should be capable of using these methods in interdisciplinary and practical contexts. Moreover, they should be familiar with scientific methods and their use in educating pupils at high schools or other education related sectors. UNS's tracer study shows that 67 % of the BPE students work as educators, 14 % as educational staff, 5% as entrepreneurs, and 14 % continue their studies for a Master's degree.

Graduates of the <u>Bachelor's degree programme Informatics Education</u> (BIE) should primarily be able to become teachers at vocational high schools. For this purpose, they should have the competences to design curricula, to lay out and implement teaching and learning activities by employing a variety of instruction and assessment strategies and methods. Besides these educational skills, graduates should also be able to engage in network engineering, software engineering and to analyse problems in information technology. Based on this profile, UNS's tracer study shows that the majority of graduates (42.9 %) work as educators, whereas 35.7 % became IT professionals in public and private enterprises, 7.1 % work as entrepreneurs and 14.3% became IT instructors in in public and private training institutions.

Based on the Self-Assessment Report and the discussions during the online audit, the peers see that the graduates of both programmes under review acquire the subject-specific competences defined in the SSC of the Technical Committees for Physics and Informatics respectively, as well as general skills, which are useful for their later professional life. The tracer studies show, that graduates are usually able to find a job shortly after graduation. Employers confirm both in the tracer studies and in the discussions, that the graduates are well suited for their positions.

While the peers are convinced that the intended qualification profiles of the programmes allow graduates to take up an occupation that corresponds to their qualification, they notice that one fundamental skill for physics education has not been addressed in neither the programme objectives, the programme learning outcomes nor the module descriptions. The peers are of the opinion that it is essential for students to learn how to prepare experiments for school life. During the audit, the peers asked the programme coordinators and teaching staff if this skill is taught since it has not been mentioned. The representatives of the programme explain that experiments are an important part of the programme, to connect theoretical knowledge with practical experience. However, the didactical concepts connected to the preparation of experiments for school life were not addressed in any of the statements. Therefore, the peers urge UNS to teach students on how to prepare experiments in a way beneficial for their pupils.

Only a small percentage of graduates pursue a Master's degree, as is typical for Indonesian universities. However, based on the discussion with students and alumni, some of whom are currently studying or have studied for a Master's degree, the peers are convinced that students obtain solid basic knowledge and skills in the relevant areas of both subjects, which adequately prepare them for further studies. Regardless of the connectivity of the study programmes, the peers conclude that in order to achieve sufficient knowledge in basic computer science, in particular in subjects such as propositional and predicate logic (Horn algorithm, resolution), syntax analysis, advanced data structures (e.g., trees, heaps), complexity (Landau symbol notation, basic complexity classes such as P and NP), more modules need to be offered in the respective topics. As of now, the peers cannot identify where or if this knowledge is conveyed.

The peers conclude that most of the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the SSC of the Technical Committees for Physics and Informatics. The objectives and intended learning outcomes of both degree programmes under review are reasonable and well-founded but can be complemented with the mentioned skills to produce graduates that are more complete.

Criterion 1.2 Name of the degree programme

Evidence:
- Self-Assessment Report

Preliminary assessment and analysis of the peers:
The peers confirm that the English translation and the original Indonesian names of both degree programmes under review correspond with the intended aims and learning outcomes as well as the main course language (Indonesian).

Criterion 1.3 Curriculum

Evidence:
- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage Ba Physics Education: https://physicsedu.fkip.uns.ac.id
- Webpage Ba Informatics Education: https://ptik.fkip.uns.ac.id
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The curricula of the degree programmes are designed to implement the programme objectives and learning outcomes and they are subject to constant revision processes (see chapters 1.1 and 6). As such, the curricula are reviewed regularly and commented on by students and teachers as well as by external stakeholders such as alumni or partners from the private sector, high schools and other universities. Regular changes are made to ensure that the curricula are up to modern standards.

The programmes under review are offered by the Faculty of Teacher Training and Education (FKIP). They are designed for eight semesters or four years, in which the students have to achieve at least 144 credit points (SKS), which is equivalent to approximately 216 ECTS points (see chapter 2.2 for more details). The maximum period of study is 14 semesters. Each semester is equivalent to 16 weeks of learning activities including one week for midterm exams and one week for final exams. The odd semester starts in August and ends in January of the following year, while the even semester lasts from February to July.

The curricula of both programmes consist of university requirements and compulsory and elective courses determined by UNS and the respective faculties and departments. University requirements are courses that need to be attended by all undergraduate students at UNS, some of which rely on national regulations. There are eight university requirements: Bahasa Indonesia, Religious Education, Civic Education, Entrepreneurship, Pancasila, Community Service, an internship and a final project. These courses run in parallel to the subject-specific courses over the entire course of the programmes.

Besides these and some fundamental courses in mathematics and statistics that teach the students general scientific competences and that lay a common foundation, the majority of the courses of the Bachelor's degree programme Physics Education cover the usual subject areas in accordance with international standards both in theoretical and experimental physics. The educational part of the programme is represented by didactic courses such as physics learning technology, evaluation of physics learning and physics learning strategies. Moreover, the students can choose elective courses from the areas of materials physics, theoretical, mechanics, electronics and instrumentation, among others.

The Bachelor's degree programme Informatics Education combines compulsory courses from various areas of information technology – such as desktop programming, applied statistics, software engineering, network administration and algorithm and data structure – with courses that cover educational aspects such as pedagogical fundamentals, learning and teaching methods or curriculum development. Moreover, BIE students can choose one of three specialisations, Software Engineering, Computer Networking or Multimedia, that come with a series of related courses starting from the fourth semester. In semesters 6 and 7, they can additionally choose elective courses related to information technology.

Based on the Self-Assessment Report and the discussions, the peers see that both programmes reasonably combine theoretical and practical elements, with a ratio of roughly 2:1. Besides the practical university courses, both programmes contain a teaching internship in semester 7 and an industrial internship. For the BPE the industrial internship is an elective module while for students of the BIE programme it is a compulsory course in semester 6.

Because the peers consider the internship to be positioned rather late in the course of studies, they discuss with the programme coordinators if students are able to experience class room situations before their internship. The programme coordinators explain that students are able to practice their teaching skills in front of other students on a regular basis. In addition, they state that they want to prepare the students as good as possible before they visit the schools for the first time. The peers are satisfied with the answer, but encourage UNS to consider moving the internship to an earlier semester.

Coming back to the aspects described in 1.1, the peers recommend evaluating the necessity of the courses. They are of the opinion that there is a variety of courses that could be merged in order to make space for other contents such as basic computer science contents within the BIE programme or more theoretical physics contents and the preparation of experiments in school life within the BPE programme. In the BIE programme, all modules that are taught theoretically and supplemented by a practical module should be merged into one module with practical and theoretical shares. For example, Structured Programming and Structured Programming Lab Work, Basic Multimedia and Basic Multimedia Lab Work or Web-Programming and Web Programming Lab Work. The same applies to the modules of the BPE programme, which are structured along the same lines (XXX theory + XXX lab work, or experiment).

As it has not become clear whether contents such as Quicksort, trees, Turing machines, Chomsky hierarchy, syntax analysis, class, method, inheritance or logic programming are part of the current curriculum and have not been mentioned in the module descriptions or whether these topics are missing, the peers request that UNS clarifies whether and if so in which modules these topics are taught. If these contents are not taught in the curriculum, they request that UNS revises the curriculum as a whole and with regard to fundamental aspects of computer science.

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 in the programmes are taught in English. The programme coordinators explain that most of the courses are delivered in Indonesian language, but many of the teaching materials (textbooks, slides) are provided in English and the final thesis can be written in English. As the peers consider active communication in English particularly important for the students, both for future jobs and to facilitate student mobility, they recommend offering more courses in English to practice this skill.

Apart from the above mentioned issues, the peers see that the curricula of both programmes are generally suitable to achieve the intended learning outcomes as defined by UNS. They cover most important areas of the respective subject and allow the students to specialise to a certain degree in accordance with their interests. In their assessment, graduates are well prepared for entering the labour market and can find adequate jobs in Indonesia.

Criterion 1.4 Admission requirements

Evidence:
- Overview of evolution of the total applicants, accepted and registered students in each degree programme between 2016 and 2019
- Admission requirements for prospective students through 3 entrance tests
- Self-Assessment Report
- Admission Website: https://spmb.uns.ac.id/
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the self-assessment report, admission of new students to UNS is possible via different modes of entry (national and local modes). The different modes of entry are designed not only to select the top-quality students from high schools, but also to provide opportunities for high school students from all over Indonesia, especially those from rural areas.

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 (30 % of the students at UNS are admitted through this selection system).

2. Joint Entrance Selection of State Universities (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide written test (subjects: mathematics, Bahasa Indonesia, English, physics, chemistry, biology, economics, history, sociology, and geography). It accounts for 40 % of the admitted students at UNS.

3. Independent Selection (Seleksi Mandiri) students are selected based on a written test (similar to SBMPTN) specifically held by UNS for prospective students that have not been accepted through SNMPTN or SBMPTN (30 % of the students at UNS are admitted through this test).

For each academic year, UNS determines the ratio of students admitted through these three ways. Generally, the number of applications is considerably higher than the number of admitted students. For the academic year 2020/21, the ratio is around 1:6 for BPE and 1:20 for BIE.

The tuition fees for the programmes are determined by the Ministry of Finance based on a proposal from UNS. There are different levels for these fees, depending on the parents' income. These range from 475,500 IDR (around 29 €) to 10,522,500 Rp. (around 650 €) per semester. Furthermore, there are various options for scholarships that cover the tuition fees.

The admission website informs potential students in great detail about the requirements and the necessary steps to apply for admission into the programmes. Since the rules are based on decrees by the ministry of education and on the university's written regulations, the peers deem them binding and transparent.

However, one aspect of the Admission Requirements remains critical to the peers. The exclusion of students who are color blind cannot be justified for both programmes. Hence, the auditors urge UNS to no longer exclude students based on disabilities.

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

Criterion 1.1

UNS provides a list of courses that teach students how to prepare experiments for school life. The peers are satisfied with the fact that preparing experiments for school life is a part of the curriculum.

UNS also addresses the lack of basic computer science contents. It states that it will include the proposed content either in existing courses or in the form of new courses.

Criterion 1.3

Regarding the separation of practical and theoretical courses, UNS states that both courses can be combined but are generally separated due to their difference in their learning outcomes. The lab work courses focus on skills, while the theory courses focus on knowledge.

UNS clarifies that some of the contents mentioned, such as quicksort, class, method, object-oriented programming and logic programming, are taught in courses such as "Algorithm and Data Structure", "Object-Oriented Programming" or "Structured Programming". As mentioned in the response to Criterion 1.1, UNS will introduce the other missing content as part of the next curriculum update.

UNS states that a variety of efforts are already underway to support students' English language proficiency and their possibilities to engage in international exchanges. The peers are pleased to see these efforts to improve the international mobility of staff and students and

hope that they will soon be reflected in increased numbers of incoming and outgoing students.

<u>Criterion 1.4</u>

UNS states that it will propose to omit the colour-blind requirement in the next intake.

The peers consider criterion 1 to be **partly fulfilled.**

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

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

Preliminary assessment and analysis of the peers:

The curricula of both Bachelor's degree programmes under review are designed for eight semesters. Average students take 18 credits in every semester, while outstanding students may take up to 24 credits. Therefore, outstanding students are able to complete the Bachelor's degree in less than 4 years. However, this case is rare since the workload of the undergraduate programmes is rather high and the curricula are designed for four years. The students' individual study plans can be different from each other, but have to be approved by their academic advisors. The curricula include theoretical and practical courses, thesis, community service, and electives.

After analysing the module descriptions and the study plans, the peers confirm that <u>both degree programmes</u> under review are divided into modules and that each module is a sum of coherent teaching and learning units. The programmes allow the students to define individual focuses through broad ranges of electives (see the study plans in the appendix).

According to data provided by UNS, the average time that students need to graduate in the BPE programme decreased within the last four years (2018: 4.99 years, 2021: 4.43 years), while the average study duration for the BIE programme increased (2016: 3.96 years, 2021:

4,87 years). Despite the fact that only very few students do not successfully finish their studies, this means that there is a significant percentage of students who need more than four years to finish their studies. Since the peers are not able to identify the reason for this, they suggest that UNS evaluates the students' actual workload individually for all courses. Based on the result, the peers recommend to revaluate which courses can be merged (see chapter 1.3) or have to be adjusted with regards to the number of credit points awarded.

In summary, the peers gain the impression that, despite the mentioned issues, 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 opportunities for students to conduct internships and exchange programmes abroad. The university's International Office supports the students and offers information on their options for student mobility. There are cooperation agreements with many international universities to facilitate exchange and credit transfer. Besides programmes by the Indonesian government, UNS has established its own competitive funding scheme for international mobility that covers travel cost, institutional fees of host universities as well as cost of living. From 2016 to 2021, around 230 students participated in this programme. Moreover, UNS has established a programme for internships in Southeast Asia.

The new policy of the Indonesian government actively supports any activities outside of the university by releasing a regulation on the Merdeka Belajar-Kampus Merdeka (MBKM), which requires the university to promote students who want to take outside their Bachelor's programme for up to three semesters (Minister of Education and Culture Regulation Number 3 Year 2020). UNS recognizes the courses taken by the students outside university based on the equality of the intended learning outcomes. The peers consider this regulation sufficient. However, according to the opinion of the peer group, the academic mobility of the students should be further promoted. The number of students from the two programmes under review who participate in international exchange programmes is still quite low and the stays are mostly quite short, typically up to one month. Furthermore and in contrast to UNS's strategy, there are currently only very few incoming exchange students, which is related to the lack of courses offered in English (see chapter 1.3).

The students confirm during the discussion with the peers that some opportunities for international academic mobility exist. However, they also point out that they wish for better information, more places and better endowed scholarships for long and short-term stays abroad. The number of available places in the exchange programmes is still limited and there are restrictions due to a lack of sufficient financial support. The lack of financial support is one of the most important factors that hinder students from joining the outgoing programmes.

Based on this feedback, the peers recommend increasing the effort to further internationalise UNS by establishing more international collaborations and exchange programmes (with lectures in English for incoming students), providing more information to the students and by offering more and better-endowed scholarships. In summary, the peers appreciate the efforts to foster international mobility and support the university in further pursuing this path.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report
- 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 SKS. The minimum workload of an undergraduate programme at UNS is 144 SKS, which corresponds to 6.528 academic hours or 216 ECTS (calculating with 30 hours per ECTS). The normal workload of each regular semester is 816 hours, which corresponds to 18 SKS (27 ECTS).

To complete the degree programme in time, Bachelor students need to take on average of 18 SKS per semester. However, the regular schedule usually covers 20-21 SKS per semester, which results in a lower credit load of the last semester (see above). If a student is not satisfied with his/her GPA, she or he can repeat the classes, but this will lead to a prolongation of the study time.

1 SKS of academic load is equivalent to 170 minutes per semester week. For regular courses, this means 50 minutes of face-to-face activity, 60 minutes of structured tasks and 60 minutes of independent learning per semester week. For thesis and internship, 1 SKS equals 170 minutes of the respective activity per semester week.

As has already been mentioned, based on the available data, students typically need between eight and ten semesters to finish their studies. The students confirm that the overall workload is high but manageable. As the lecturers explain, the workload for assignments and individual study in each course is estimated by the lecturers based on their experience. While the peers consider the workload and the awarded credit points to be appropriate, they recommend establishing a system to monitor the actual workload of the students in order to gather information on courses that require more time than estimated by the lecturers (see chapter 1.3 and 2.1). The peers recommend reviewing the overall distribution of the workload in the course of this evaluation to avoid peak loads.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report

- Module descriptions

- Discussions during the audit

Preliminary assessment and analysis of the peers:

The programmes under review make use of several different educational methods for each course such as interactive lectures, small group discussions, problem-based learning, collaborative learning, laboratory practical work, computer-based assignments, seminars, case-study, literature studies as well as excursions, internships, student community services, and final projects.

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. UNS wants to encourage the students to gain knowledge from different scientific areas and wants to introduce them to research activities. This leads to the transition from a teacher centred to a student centred learning approach. The teaching and learning is supported by a broad range of media, both traditional (books, papers) and online (videos, presentations etc.). In the course of the Covid-19 pandemic, UNS has swiftly switched to online learning with videoconferences, recorded videos and other media. Online learning is conducted by using WhatsApp group chats, Google Classroom, Zoom or Google Meet sessions.

UNS introduced an online-learning platform SPADA in order to monitor the teaching methodology that is applied and make accessible the various course materials. Therefore, each teacher or professor must upload his or her teaching materials and working procedures on SPADA.

During the audit, students indicated that they are satisfied with the applied teaching methods and that the switch to online teaching during the Covid-19 pandemic worked without any inconveniences.

In summary, the peer group judges the teaching methods and instruments to be suitable for supporting the students in achieving the intended learning outcomes.

Criterion 2.4 Support and assistance

Evidence:

- Websites

- Self-Assessment Report

- International Students Guide

- Discussions during the audit

Preliminary assessment and analysis of the peers:

In order to support students in completing their studies on time with good achievements, the university and the faculty provide academic and personal support and assistance through various means. The offers can be divided into two types: academic support and non-academic support. Academic advice includes the academic advisors, the Counselling Guidance Centre, the International Office, the programme coordinators, the Dean and the supervisors for the Bachelor's thesis. Non-academic supports comprise the Medical Centre, the Sports Centre, the Disability Study Centre, the Language Centre, the Career Development Centre, the Central Library, computer laboratories, Student Creativity Program and student dormitories.

The main contact person for every student is their academic advisor, who is assigned to them in their first semester. An academic advisor shall help them develop an adequate schedule for their studies, choose electives according to their skills and interests and support them in case of academic and non-academic problems. Students have the opportunity to meet their academic advisor, who is also responsible for monitoring their study progress, on a regular basis. Furthermore, there are supervisors for the thesis, the fieldwork practice or teaching internship, and the community service, who give advice on specific issues related to these aspects. In UNS, this mentoring process is supported by the presence of the academic administration information system (SIAKAD) that helps to monitor the academic progress and to approve semester plans as well as the final undergraduate thesis.

The Disability study Centre helps and guides students who have individual problems, such as anxiety, depression or other personal or psychological issues. The Career Development Centre offers scholarships, entrepreneurship programmes, student creativity programmes and other similar activities. There are many scholarships offered to students, (e.g. from private companies, the government or other foundations). This includes scholarship for students from low-income families and for those with high academic achievements. New students can attend classes to develop their effective learning and soft skills.

In addition, every student who enrols for the Bachelor's thesis course will be assigned two to three thesis supervisors. The role of the thesis supervisors is to help students to complete their thesis research; they also monitor the progress of the thesis in order to ensure the completion of the thesis in the intended amount of time.

The students confirm towards the peers that they are supervised in the research group during their work on the Bachelor's thesis. There are regular meetings where the students present their results and receive feedback from the other members.

All students at UNS have access to the online-learning platform SPADA. By using SPADA, lecturers can upload their syllabus and learning materials or modules as well as assignment for students. Through SPADA, students can also interact with other students and lecturers.

While the overall support is remarkable, the peers note that the support during and before the internships needs to be improved. What the peers are missing is a formalised document that lists guidelines for the implementation of the internship. This would be beneficial for the preparation of the internships and would help to ensure that the intended learning outcomes can be achieved.

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:

Criterion 2.1 & 2.2

While UNS states that the workload is no problem, based on the students' GPA, they agree to evaluate the students' workload as they agree that students' workload is not easy to determine due to students' activities related to internship, exchange and final projects. As means to this end, UNS provides the questionnaire for its "Student Workload Survey". UNS will also consider the distribution of the workload between the semesters when redesigning the curricula.

The peers consider criterion 2 to be **partly fulfilled.**

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:
- Self-Assessment Report
- Module descriptions
- Guide of Learning Assessment
- Websites
- Academic calendar
- Sample examination papers and Bachelor's theses

Preliminary assessment and analysis of the peers:
Each course has to determine objectives, which support the achievement of the Programme

Learning Outcomes of the respective programme. Accordingly, each course must assess whether all defined learning outcomes stated in the module description have been achieved.

According to the self-assessment report, quizzes, tests, practical performances, assignments, small projects, reports and presentations are implemented to assess the students' achievement of the learning outcomes. At the first meeting of a course, the students are informed about what exactly is required to pass the module. The form and length of each exam is mentioned in the course descriptions that are available to the students via UNS' homepage. It is common to hold small quizzes every two or three weeks, but there are generally no unscheduled tests. The students are informed about mid-term and final exams via the Academic Calendar. The final grade of each module is calculated based on the score of these individual kinds of assessment. The exact formula is given in the module handbook. UNS uses a grading system with the grades A, A-, B+, B, C+, C, D and E, where a C (equivalent to a Grade Point of 2) is necessary to pass a module.

Based on the academic regulation to be eligible to take final exam, students must attend at least 75% of the total course sessions. On the other hand, students must attend all lab work activities in order to get a practice examination permit. Students who have not yet reached the minimum achievement criteria have to join the remedial programme which is an additional programme that should help them improve their unsatisfactory results. The lecturers will provide several alternatives such as a second trial of exams, additional assignments, remedial learning or a peer tutor to accommodate this programme. In some instances, lectures may not allocate specific times for remedy and provide direct feedback on students' work to improve the assignment instead. The remedial program allows students to fix their shortcomings and finish the course on time with satisfactory results and is meant to shorten the study period.

The peers discuss with the students how many and what kind of exams they have to take each semester as both study programmes are divided into a high number of small modules. They learn that for each course there is one mid-term exam and one final exam in every semester. Usually, there are additional practical assignments or quizzes. The final grade is the sum of the sub exams. The students appreciate that there are several short exams instead of one big exam as this forces them to continuously study during the entire semester and not having to solely work for one final exam at the end of the semester. The students also confirm that they are well informed about the examination schedule, the examination form and the rules for grading.

Every student is required to do a final thesis in the fourth year of studies. Prior to the actual research work, the students are required to write a research proposal and present it in a seminar attended by lecturers and other students who form a research group. The research proposal has to be accepted by the Dean and the supervisor committee who will then appoint the research supervisors. Usually, there are 2 to 3 research supervisors for each student. One

will act as the principal supervisor and the others act as co-supervisors. In case the student writes her or his thesis in collaboration with the industry, she or he is also assigned a supervisor from the industry. After completing the work on the Bachelor's thesis, the student has to present and defend the results in front of teachers and fellow students.

Overall, the peers are satisfied with the regulation of exams in the degree programmes. They also inspect a sample of examination papers and Bachelor's theses and are satisfied with their general quality.

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

UNS does not comment on this criterion in its statement.

The peers consider criterion 3 to be **fulfilled**.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Staff Handbooks
- Overviews of teaching load
- 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 lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities. For example, a full professor needs to hold a PhD degree. In addition, the responsibilities and tasks of a staff member with respect to teaching, research, and supervision partly depend on the academic position.

According to the Self-Assessment Report, the teaching staff for BPE consists of 23 full-time teachers (13 with a PhD, 10 with a Master's degree). For BIE, there are 12 male teaching staff (2 with a PhD, 10 with a Master's degree, of which 2 are currently studying for a PhD). The current teacher to student ratio for BPE is 1:14, for BIE UNS gives it as 1:27. Lecturers from other faculties and programmes or visiting lecturers from the industry, foreign universities and local schools support the regular teaching staff.

During the audit, the peers asked if UNS has undertaken any efforts to find female lecturers for their programme. The programme coordinators responded that they are not discriminating against female lecturers but have not received any suiting applications from female lecturers so far. Since this stance appears to be rather passive, the peers recommend becoming active in finding suitable female lecturers.

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.

UNS provides data concerning the overall workload per staff member for both programmes. This data shows that over the last years, the lecturers have spent 45 hours per week on average on teaching, research and community service activities in BPE and around 36 hours per week in BIE.

During the audit, the lecturers state that they would appreciate more laboratory staff and technicians for the BPE programme to support them because of the increasing students number. Since the actual workload of the lecturers occurs to be already high, the peers recommend relieving the teaching staff from these technical and supportive activities in the practical courses.

Criterion 4.2 Staff development

Evidence:

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

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report, UNS encourages the continuing professional development of its staff. For this purpose, various opportunities are provided. There is a mandatory didactic training for new academic staff that encompasses curriculum design, teaching material, and innovative teaching and learning methods. Moreover, in each semester workshops are held to refresh and to deepen various didactic competences.

All teaching staff are encouraged to study abroad or to participate in international research projects and conferences in order to enhance their knowledge, increase their English proficiency and to build international networks. For this purpose, the university informs about possible scholarships to support academic mobility. Particularly for junior lecturers with a Master's degree, UNS offers systematic training to prepare them for acquiring a PhD abroad, for instance through English courses, information on foreign education systems, administrative support, and supporting (international) research collaborations.

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 the university, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars.

The peers appreciate the university's efforts in this regard and consider the support mechanisms for the continuing professional development of the teaching staff adequate and sufficient. They particularly recommend to continue the efforts to strengthen the lecturers' English skills, as these are a basis for fruitful international exchange and cooperation. The peers endorse UNS's current policy to encourage their teaching staff with a Master's degree to pursue PhD degrees abroad.

Criterion 4.3 Funds and equipment

Evidence:

- List of laboratories and equipment

- Photos and videos of the facilities

- Self-Assessment Report

- Discussions during the audit

Preliminary assessment and analysis of the peers:

The university and the faculty are mainly funded by the Indonesian government, through the tuition fees and through grants for research projects. The figures presented by the university show that the faculty's income is stable and the funding of the degree programmes is secured. The academic staff emphasise that from their point of view, both undergraduate programmes under review receive sufficient funding for teaching and learning activities.

Students and staff can use UNS's central library, which is open from Monday to Saturday from 8 am to 9 pm. Besides regular books and journals, it provides many e-books (for example through SpringerLink, Gale, Emerald and ProQuest) as well as access to electronic journals (through EBSCO, ProQuest, Cambridge, IGI Global, Science Direct, SCOPUS, Emerald, National Library of Indonesia).

From the provided documents and videos of the laboratories, the peers deduct that there are no severe bottlenecks due to missing equipment or a lacking infrastructure. Basic technical equipment for teaching and research is available. However, during the presentation of the laboratories, the peers notice that some of the existing equipment of the BPE appears to be rather old. They also learn that equipment for some courses is only available in a small number. Consequently, the peers are convinced that the laboratory equipment could be improved

in terms of both quantity and quality. For the BIE programme the necessary equipment to sustain the programme seems to be sufficient, both in terms of quality and quantity.

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

Criterion 4.1

UNS describes its recruitment process and states that every applicant who has academic qualifications and competencies has equal opportunity. UNS emphasises that it encourages female applicants but does not favour gender over qualification.

UNS explains that its departments cooperate and exchange laboratory staff and technicians to cope with the increasing number of students.

Criterion 4.3

The physics department agrees to review the equipment and commits to improving the equipment both qualitatively and quantitatively within the next year.

The peers consider criterion 4 to be **fulfilled**.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module handbooks
- Webpage Ba Physics Education: https://physicsedu.fkip.uns.ac.id
- Webpage Ba Informatics Education: https://ptik.fkip.uns.ac.id

Preliminary assessment and analysis of the peers:
The module descriptions for both programmes have been published on the university's website and are thus accessible to the students as well as to all stakeholders. The peers observe that they contain information on all important issues, that is responsible persons, the intended learning outcomes, the credit points awarded, the workload, the main content, prerequisites, examinations, and recommended literature.

However, regarding the issue addressed under 1.1 and 1.3, the peers are not sure if the discussed contents are missing in the module descriptions or are not included in the programmes. Therefore, UNS has to either rewrite the module descriptions so that it becomes

apparent in which courses the missing contents are taught or to add the contents to suitable courses.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Sample Transcript of Records for each degree programme
- Sample Diploma certificate 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 degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA. However, comparative information on the grade distribution in the student cohort is missing. There-fore, the peers urge UNS to include this information in the Diploma Supplement.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Report
- Websites
- Discussions during the audit
- Guide of Learning Assessment
- Internal rules of quality assurance

Preliminary assessment and analysis of the peers:

The auditors confirm that the rights and duties of both UNS and the students are clearly de-fined and binding. All rules and regulations are published on the university's website and hence available to all stakeholders. In addition, the students receive all relevant course ma-terial in the language of the degree programme at the beginning of each semester.

Final assessment of the peers after the comment of the Higher Education Institution regard-ing criterion 5:

Criterion 5.1

UNS submits revised versions of the module descriptions and clarifies what content was missing in the description and what content will be added as part of the upcoming curriculum changes.

<u>Criterion 5.2</u>

UNS agrees to include grade distribution to the Diploma Supplement. This will enable readers of the Diploma to assess the individual mark in comparison.

The peers consider criterion 5 to be **partly fulfilled.**

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Internal rules of quality assurance

- Internal quality audit assessment form

- Questionnaire used for the evaluation of studies

- Results of tracer studies

- Self-Assessment Report

- 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 the BPE programme have received the highest accreditation status (A), the BIE programme has received the second highest accreditation status (B) from BAN-PT.

Since UNS is striving to become an internationally acknowledged university, the reliance on students' feedback and the necessity to ensure and improve the employability of the graduates are of major importance to the coordinators. Internal evaluation 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. The course evaluations are conducted at the end of each semester; the questionnaire was developed by the course survey committee and includes questions with respect to the course in general and about the teachers' performance. Further surveys are carried out by gathering statistics about graduates and alumni. The discussion with the students revealed that those in charge are always eager and open for feedback aside from the official evaluations and that students have the impression that their comments are taken into consideration with regard to the further improvement of the programmes. This becomes apparent in the constant curricular revision process that is performed under participation of students and industry partners. The industry representatives confirm in the discussion that the university is eager to receive feedback about new developments and trends and the employability of their graduates.

As the peers understand it, the students as crucial stakeholders of the programmes are involved in the quality assurance processes in various ways, for instance through the surveys, but also through discussions with student representatives. Students and other stakeholders, however, are currently not involved in a formal way at university, faculty and department level. The peers recommend that UNS strengthen the stakeholder's involvement by implementing a stakeholder board.

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

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

UNS does not comment on this criterion in its statement.

The peers consider criterion 6 to be **fulfilled.**

D Additional Documents

No additional documents needed.

E Comment of the Higher Education Institution (23.08.2022)

UNS has issued in the following statement:

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

ASIIN Peers Comments:

While the peers are convinced that the intended qualification profiles of the programmes allow graduates to take up an occupation that corresponds to their qualification, they notice that one fundamental skill for physics education has not been addressed in neither the programme objectives, the programme learning outcomes nor the module descriptions.

BPE Response

We think that our program's educational objective has covered the fundamental skill of educational physics, including physical learning and pedagogical (**PEO 1 and PEO 4**). The PEO of Bachelor Physics Education:

1. Able to apply the scientific **concepts of physics and the concepts and principles of technological pedagogical content knowledge** in the field of Physics with a global perspective in their professional practice.

2. Able to think critically, analytically, and solutively in solving problems in the field of work, be responsible and carry out professional ethics.

3. Able to develop the spirit of lifelong learning through further education or training.

4. Able to develop the spirit of cooperation to **improve and develop physics and physics learning**, as well as its application in society

Furthermore, the courses describing the fundamental skill for physics education are:

A. Compulsory Courses
   1. Newtonian Mechanics, Fluids, and Heat (4.5 ECTS)
   2. Electricity and Magnetism (4.5 ECTS)
   3. Educational Sciences (3 ECTS)
   4. Development of Learners (3 ECTS)
   5. Physics Learning Technology (3 ECTS)

6. Animation Media of Physics Learning (4.5 ECTS)
7. Evaluation of Physics Learning (3 ECTS)
8. Physics Learning Strategy (3 ECTS)
9. Planning Physics Learning (4.5 ECTS)
10. Microteaching (3 ECTS)
11. Internship Teacher Preparation (9 ECTS)

B. Elective Courses

1. Physics Learning Assessment (3 ECTS)
2. Development of Physics Teacher Profession (3 ECTS)
3. Physics Teaching Management (3 ECTS)
4. Physics Vocational High School (3 ECTS)

ASIIN Peers Comments:

The peers are of the opinion that it is essential for students to learn how to prepare experiments for school life.

BPE Response

We have courses that teach **the** way of teaching and preparing experiments for school through Physics Learning Strategy (02053142011), Planning Physics Learning (02053242032), Laboratorium Management (02053152033) and Physics Laboratory (02053226004).

ASIIN Peers Comments:

The peers conclude that in order to achieve sufficient knowledge in basic computer science, in particular in subjects such as propositional and predicate logic (Horn algorithm, resolution), syntax analysis, advanced data structures (e.g., trees, heaps), complexity (Landau symbol notation, basic complexity classes such as P and NP), more modules need to be offered in the respective topics. As of now, the peers cannot identify where or if this knowledge is conveyed.

BIE Response:

In response for to the issues above (especially in basic knowledge of computer science issue), the following action will be done:

1. Restructure the curriculum with new courses added such as Calculus, Discrete Mathematics, and Computational Theory. The Mathematic for Computer Science course content also will be merged with the newly aforementioned courses.
2. Some content such as Propositional and Predicate Logic will be covered in Discrete Mathematics course.
3. Some content such as (Automata & Syntax Analysis), Chomsky Normal Form and Turing will be covered in Computational Theory course.
4. More modules will be offered in the new curriculum update as elective courses.

Criterion 1.3 Curriculum

ASIIN Peers Comments:

The peers consider the internship to be positioned rather late in the course of studies, they discuss with the programme coordinators if students are able to experience classroom situations before their internship. The programme coordinators explain that students are able to practice their teaching skills in front of other students on a regular basis. In addition, they state that they want to prepare the students as good as possible before they visit the schools for the first time. The peers are satisfied with the answer but encourage UNS to consider moving the internship to an earlier semester.

BPE Response:

Thanks for your suggestion, the internship program in senior high school has a requirement course that should be taken by the student such as

1. Evaluation of Physics Learning (Semester 3)
2. Physics Learning Strategy (Semester 3)
3. Planning Physics Learning (Semester 4)
4. Microteaching (Semester 6)

However, they must take three courses (point 1 to 3) as a prerequisite. In addition, in these courses they also must conduct observations in school. Therefore, ideally students take the internship in semester 7.

BIE Response:

In response to the issue above, a new course learning outcomes (CLO) will be added to each educational-related course. The CLO requires students to observe practices carried out in the schools. The CLO will be added to the following courses:

Course Name in Indonesia	Course Name in English	Credit
Ilmu Pendidikan	Educational Science	2 CP
Profesi Kependidikan	Educational Profession	2 CP
Strategi Belajar Mengajar	Teaching and Learning Strategies	2 CP
Evaluasi Pendidikan	Learning Evaluation	2 CP

ASIIN Peers Comments:

They are of the opinion that there is a variety of courses that could be merged in order to make space for other contents such as basic computer science contents within the BIE programme or more theoretical physics contents and the preparation of experiments in school life within the BPE programme. In the BIE programme, all modules that are taught theoretically and supplemented by a practical module should be merged into one module with practical and theoretical shares. For example, Structured Programming and Structured Programming Lab Work, Basic Multimedia and Basic Multimedia Lab work or Web-Programming and Web Programming Lab Work. The same applies to the modules of the BPE programme, which are structured along the same lines (XXX theory + XXX lab work, or experiment).

BPE Response:

Thank you for the suggestion given. We are going to respond as fast as possible for the next curriculum reconstruction. However, in the recent curriculum, we already have some courses as preparation of experiments in school life, such as Physics Learning Strategy, Planning Physics Learning, Laboratorium Management and Physics Laboratory. Moreover, we also have some elective courses in theoretical physics contents which are deeper in terms of physics content, i.e. Optoelectronics, Electrodynamics, and Astrophysics.

Regarding the practicum and theory courses which are separated. Because of the different learning outcomes both aspects are different. The practicum is focused on the skill aspect, while the theory is more focused on knowledge. However, both the theory and practicum are intersect, therefore it is possible to be combined.

BIE Response:

In response to the requirements, the following actions will be done:

1. BIE consolidates Lab Work courses (20 Courses) into 6 Lab work courses.
2. Restructure the distribution of the courses that each semester the credit will be between 19-22 Credit Point in semester 1-5, and 11 CPs of mandatory courses for semester 6-7,

ASIIN Peers Comments:

As it has not become clear whether contents such as Quicksort, tree, Turing, Chomsky, syntax analysis, class, method, inheritance or logic programming are part of the current curriculum and have not been mentioned in the module descriptions or whether these topics are missing, the peers request that UNS clarifies whether and if so in which modules these topics are taught. If these contents are not taught in the curriculum, they request that UNS revises the curriculum as a whole and with regard to fundamental aspects of computer science.

BIE Response:

In response to the requirements above, BIE has mapped some contents such as quicksort, tree, class, method, inheritance or logic programming in the current curriculum. In the BIE curriculum, some the aforementioned contents are available following courses:

- Quicksort and tree as a content of Algorithm and Data Structure (*Algoritma dan Struktur Data*) course.
- Class, method, and inheritance as a content of Object-Oriented Programming (*Pemrograman Berorientasi Objek*) course.
- Logic programming as a content of Structured Programming (*Pemrograman Terstruktur*) course.

As discussed in the criterion 1.1 section, BIE will add a Computational Theory course to cover the missing/unavailable material content such as Quicksort, tree, Turing, Chomsky, syntax analysis in the new curriculum design.

Criterion 2.1 Structure and Modules

ASIIN Peers Comments:

Despite the fact that only very few students do not successfully finish their studies, this means that there is a significant percentage of students who need more than four years to finish their studies. Since the peers are not able to identify the reason for this, they suggest that UNS evaluates the students' actual workload individually for all courses. Based on the result, the peers recommend revaluating which courses can be merged (see chapter 1.3) or have to be adjusted with regards to the number of credit points awarded.

BPE Response:

Thank you for the suggestion given. However, the student's workload is not a problem based on the student's GPA in the first 3 year. For the last year, the student's workload is less than before. However, since they conduct internships, student exchange, and final projects, hence they cannot complete the study on time. For that reason, we are going to monitor, evaluate, and motivate them more intensively and also conduct curriculum reconstruction for the next intake.

BIE Response:

As discussed in the criterion 1.1 and criterion 1.3 section, further action will be taken. Restructure the distribution of the courses that each semester the credit will be between 19-22 Credit Points in semester 1-5, and 11 CPs of mandatory courses for semester 6-7, and consolidate Lab Work courses (20 Courses) into 6 Lab work courses. The design of our curriculum has been discussed in criterion 1.3 section.

ASIIN Peers Comments:

The peers recommend increasing the effort to further internationalise UNS by establishing more international collaborations and exchange programmes (with lectures in English for incoming students), providing more information to the students and by offering more and better-endowed scholarships. In summary, the peers appreciate the efforts to foster international mobility and support the university in further pursuing this path.

BPE Response:

As in section 1.3 feedback, we also conduct visiting professors from overseas, some courses delivered in English, support students in international exchange students by IISMA (Indonesian International Student Mobility Award), international internship by SEATEACHER (South East Asian Teacher), and as a presenter in international conferences. UNS also facilitates lectures for international collaboration research and joint authorship for publication.

BIE Response:

Currently, this one should be an ongoing activity for UNS. Last semester BIE hosted exchange students from the Philippines and Malaysia for web design and databases courses. All material delivered in English. We will continue doing similar classes for the upcoming semester for the same courses and other courses.

Criterion 2.2 Workload and Credits

ASIIN Peers Comments:

The peers recommend reviewing the overall distribution of the workload in the course of this evaluation to avoid peak loads.

BPE & BIE Response:

Thank you for the suggestion given. We have implemented the following survey to review the overall distribution of the workload in this semester:

[TRANSLATION]

STUDENT WORKLOAD SURVEY
In the process of higher education, students are expected to achieve the
learning outcomes that are set to graduate from the study program they are engaged in. This learning achievement is achieved by implementing a study
program curriculum with a workload (face-to-face interaction with lecturers, structured tasks, and independent study) with predetermined semester
credit units (credits). Students, as subjects of education, directly take
education by collecting the credits to meet the graduation requirements.
This survey is designed to determine students' understanding of workload in education and identify the application of this workload in the education
process.

General instructions:
1. *Fill in the questionnaire carefully by ticking the value column that you think is appropriate*
2. *Assessment score:*
   score 1 = very bad,
   score 2 = not good,
   score 3 = good,
   score 4 = very good
3. *The answers you provide will be kept confidential and will not have any negative impact on yur education process.*
   1. Subjects: …………………….
   2. Credit load (credit) for courses: ………….
   3. Do you understand the meaning of the credit load for your studies? Yes/No

NO	SURVEY QUESTION	Score			
		1	2	3	4
1.	At the beginning of the lecture, the lecturer has				

	explained the Semester Learning Plan (RPS) for the course with the right learning load				
2.	I understand the workload demands of the course to achieve learning outcomes				
3.	The material and depth of face-to-face lectures are sufficient so that you can achieve the expected level of learning achievement				
4.	The material and the depth of the coursework are sufficient so that you can achieve the expected level of learning achievement				
5.	How much time do you spend on self-study per week for this course (Maximum self-study 60 minutes/ credit)	>60	60	<60	
6.	How much time do you use to do structured assignments per week for this course (Self-study maximum 60 minutes/ credit)	>60	60	<60	

7. Give your suggestions and feedback
....

Criterion 4.1 Staff

ASIIN Peers Comments:

During the audit, the peers asked if UNS has undertaken any efforts to find female lecturers for their programme. The programme coordinators responded that they are not discriminating against female lecturers but have not received any suiting applications from female lecturers so far. Since this stance appears to be rather passive, the peers recommend becoming active in finding suitable female lecturers.

BIE Response:

Regarding this matter, the recruitment process for BIE and other study programs is conducted by the university. They administer a certain format of recruitment announcement as part of legal and compliance to the government regulation. As it is determined by the Minister of Education and Culture Regulation No 84. 2013 and Rector Regulation No. 569. 2016 in 2nd chapter. The regulation states that everyone who has academic qualifications and competencies has equal opportunity to become lecturer in state university and private college. For civil servant candidates, there is also government regulation (UU No 5. 2014 chapter 61) states that every Indonesian citizen has the same opportunity to apply to become a civil servant in.

Regarding how it is advertised, the study program determines the degree and qualification requirement for the position, however, it is the university's authority to communicate with the general public. We do encourage female applicant, however, we never favor gender over qualification.

ASIIN Peers Comments

More laboratory staff and technicians for the BPE programme to support them because of the increasing students number. Since the actual workload of the lecturers occurs to be already high, the peers recommend relieving the teaching staff from these technical and supportive activities in the practical courses

BPE Response:

We will conduct resource sharing with another department to fulfil the sufficient number of laboratory staff and technicians.

In Indonesia, the working load of a lecturer (BKD) has a regulation of 12 – 16 Credit Points (0,85-1,13 FTE). Based on the SAR data, the amount of workload the lecturer has already matched to the regulation. If the workload is less than that, the lecturer will not be paid their salary. Meanwhile, to relieve the teaching staff from these technical and supportive activities, some lecturers offer students as research assistance.

Criterion 4.2 Staff development

ASIIN Peers Comments

Encourage their teaching staff with a Master's degree to pursue PhD degrees abroad.

BIE & BPE Response:

University has provided scholarship, counselling and information for the staff that want to study abroad and the study program always reminds the staff to study abroad.

Criterion 4.3 Funds and Equipment

ASIIN Peers Comments

During the presentation of the laboratories, the peers notice that some of the existing equipment of the BPE appears to be rather old. Peer: improved in terms of both quantity and quality

BPE Response:

The Faculty commit to fulfil the equipment both quantity and quality this year. Here we attach the list of laboratory equipment purchased in this year (Appendix 4.3)

Criterion 5.1 Module Description

ASIIN Peers Comments

However, regarding the issue addressed under 1.1 and 1.3, the peers are not sure if the discussed contents are missing in the module descriptions or are not included in the programmes. Therefore, UNS has to either rewrite the module descriptions so that it becomes apparent in which courses the missing contents are taught or to add the contents to suitable courses.

BPE Response:

We apologize for the missing content in the module description. We are going to include the missing content this response. Here with the three elective courses which are miss (Optoelectronics, Electrodynamics, and Astrophysics) in Appendix 5.1.

BIE Response:

We will include some of the missing content in Appendix 5.1. As discussed in Criterion 1.1 and Criterion 1.3 section, some of the missing materials have been covered in the following course:

- Quicksort and tree as a content of Algorithm and Data Structure (*Algoritma dan Struktur Data*) course.
- Class, method, and inheritance as a content of Object-Oriented Programming (*Pemrograman Berorientasi Objek*) course.
- Logic programming as a content of Structured Programming (*Pemrograman Terstruktur*) course.

Meanwhile, some uncovered materials will be added in the curriculum update explained in criterion 1.3 section as a content/material in the new course.

- Some content such as Propositional and Predicate Logic will be covered in Discrete Mathematics course.
- Some content such as (Automata & Syntax Analysis), Chomsky Normal Form and Turing will be covered in Computational Theory course.
- More modules will be offered in the new curriculum update as elective courses.

Criterion 5.2 Diploma and Diploma Supplement

ASIIN Peers Comments:

The peers confirm that the students of both degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA. However, the Diploma Supplement does not contain all necessary information about the degree programmes. Comparative information on the grade distribution in the student cohort is missing. Therefore, the peers urge UNS to include this information in the Diploma Supplements.

BPE and BIE Response:

Thanks for the suggestion. We will propose to add the information about grade distribution in the Diploma Supplement. However, in every course evaluation in each semester, there is grade distribution as seen in Appendix 5.2.

F Summary: Peer recommendations (31.08.2022)

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 Physics Education	With requirements for one year	-	30.09.2028
Ba Informatics Education	With requirements for one year	-	30.09.2028

Requirements

For all degree programmes

A 1. (ASIIN 1.4) UNS must not exclude students from admission because of colour-blindness.

A 2. (ASIIN 2.4) Ensure that students get adequate support during their internships at companies and at schools as well. Clarify guidelines and make them available to the students.

A 3. (ASIIN 5.2) Ensure that the Diploma Supplements contain comparative information on the grade distribution in the student cohort.

For Ba Informatics Education

A 4. (ASIIN 1.1, ASIIN 1.3) Basic computer science contents have to be added to the curriculum.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3, 2.1) It is recommended to strengthen the university's internationalization efforts, for instance by establishing more international collaborations and providing more information, support and funding opportunities for student mobility and by teaching more courses in English.

E 2. (ASIIN 1.3, 2.1, 2.2) It is recommended to merge similar courses to reduce the overall workload.

E 3. (ASIIN 6) It is recommended to establish advisory boards with external stakeholders on department level.

For Ba Physics Education

E 4. (ASIIN 1.3) It is recommended to add more basic theoretical physics contents to the curriculum.

E 5. (ASIIN 2.2) It is recommend to distribute the workload more evenly across the semesters.

E 6. (ASIIN 4.3) It is recommended to check if the equipment is sufficient in terms of quantity and quality.

G Comment of the Technical Committees

Technical Committee 04 – Informatics/Computer Science (07.09.2022)

Assessment and analysis for the award of the ASIIN seal:

Mr Witt reports on the procedure. The TC discusses the procedure and proposes a more precise wording for requirement A4. The suggested wording now reflects the title of the study programme. The remaining requirements and recommendations are approved without any changes.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

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

Technical Committee 13 – Physics (12.09.2022)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and agrees with the assessment of the peers.

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

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

H Decision of the Accreditation Commission (23.09.2022)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses the procedure and agrees with the peers' assessment and decides to award the ASIIN seal with the proposed requirements and recommendations. The Accreditation Commission agrees to adapt A 4. to the proposal of the TC 04.

The Accreditation Commission decides to award the following seals:

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

Requirements

For all degree programmes

A 1.   (ASIIN 1.4) UNS must not exclude students from admission because of colour-blindness.

A 2.   (ASIIN 2.4) Ensure that students get adequate support during their internships at companies and at schools as well. Clarify guidelines and make them available to the students.

A 3.   (ASIIN 5.2) Ensure that the Diploma Supplements contain comparative information on the grade distribution in the student cohort.

For Ba Informatics Education

A 4.   (ASIIN 1.1, ASIIN 1.3) Fundamental Informatics contents have to be added to the curriculum.

Recommendations

For all degree programmes

E 1.   (ASIIN 1.3, 2.1) It is recommended to strengthen the university's internationalization efforts, for instance by establishing more international collaborations and providing more information, support and funding opportunities for student mobility and by teaching more courses in English.

E 2.   (ASIIN 1.3, 2.1, 2.2) It is recommended to merge similar courses to reduce the overall workload.

E 3.   (ASIIN 6) It is recommended to establish advisory boards with external stakeholders on department level.

For Ba Physics Education

E 4.   (ASIIN 1.3) It is recommended to add more basic theoretical physics contents to the curriculum.

E 5.   (ASIIN 2.2) It is recommend to distribute the workload more evenly across the semesters.

E 6.   (ASIIN 4.3) It is recommended to check if the equipment is sufficient in terms of quantity and quality.

I Fulfilment of Requirements (22.09.2023)

Analysis of the experts and the Technical Committees (14.09.2023)

Requirements

For all degree programmes

A 1. (ASIIN 1.4) UNS must not exclude students from admission because of colour-blindness.

Initial Treatment	
Peers	fulfilled Justification: The colour blind admission requirement has been removed for both programmes.
TC 04	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.
TC 13	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.

A 2. (ASIIN 2.4) Ensure that students get adequate support during their internships at companies and at schools as well. Clarify guidelines and make them available to the students.

Initial Treatment	
Peers	fulfilled Justification: UNS provides clear guidelines on how to support students during their internship.
TC 04	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.
TC 13	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.

A 3.   (ASIIN 5.2) Ensure that the Diploma Supplements contain comparative information on the grade distribution in the student cohort.

Initial Treatment	
Peers	fulfilled Justification: The diploma has been adjusted and now contains comparative information on the grade distribution in the student cohort.
TC 04	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.
TC 13	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.

For Ba Informatics Education

A 4.   (ASIIN 1.1, ASIIN 1.3) Fundamental Informatics contents have to be added to the curriculum.

Initial Treatment	
Peers	fulfilled Justification: UNS has successfully incorporated the requested contents and made them visible. Nevertheless, it is strongly recommended that UNS considers addressing the aspect of logic programming as defined by J.W. Loyd in "Foundations of Logic Programming." This addition would enhance the comprehensiveness of the content and contribute valuable insights to the overall understanding of the topic
TC 04	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.
TC 13	fulfilled Vote: unanimous Justification: The TC 13 follows the vote of the experts.

Decision of the Accreditation Commission (22.09.2023)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Physics Education	All requirements fulfilled		30.09.2028
Ba Informatics Education	All requirements fulfilled		30.09.2028

Appendix: Programme Learning Outcomes and Curricula

According to the programme website, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the <u>Bachelor's degree programme Physics Education</u>:

The objectives of BPE Universitas Sebelas Maret are to produce graduates who are:

1. Able to apply the scientific concepts of physics and the concepts and principles of technology pedagogical content knowledge in the field of Physics with a global perspective in their professional practice.

2. Able to think critically, analytically and solutively in solving problems in the field of work, be responsible and carry out professional ethics.

3. Able to develop the spirit of lifelong learning through further education or training.

4. Able to develop the spirit of cooperation to improve and develop physics and physics learning, as well as its application in society.

Programme Learning Outcomes:

1. Mastering theoretical concepts of classical and modern physics (quantum)
2. Using Information and Communication Technology (ICT) for the development of the physics learning process
3. Using mathematical concepts for the problem solving in the development of physics concepts
4. Implementing theoretical concepts of pedagogy, andragogy, educational psychology and student development in physics learning
5. Designing, implementing, analyzing data and evaluating experiments
6. Utilizing and developing various physics learning techniques, strategies and assessments
7. Managing a physics laboratory in high school
8. Self Developing through formal and non-formal education
9. Conducting research and write research results in the form of scientific works
10. Communicating effectively in Indonesian and English
11. Conducting a work in both independently and as a team in applying scientific concepts in society
12. Showing of an attitude of religious, humanity, ethics, nationalism, culture, independence and a professional attitude in the field of Physics Education.

The following **curriculum** is presented:

Semester 1

Code	Course	Credit	ECTS	Description
02053112009	Pancasila	2	3	Compulsory
02053112010	Indonesian Language	2	3	Compulsory
02053132003	Development of Learners	2	3	Compulsory
02053132001	Educational Science	2	3	Compulsory
02053142001	English For Academic Purposes	2	3	Compulsory
02053143002	Fundamental Mathematics	3	4.5	Compulsory
02053143008	Measuring and Instrumentation Tools	3	4.5	Compulsory
02053143004	Newtonian Mechanics, Fluids and Heat	3	4.5	Compulsory
02053143033	Experiment of Newtonian Mechanics, Fluids and Heat	1	1.5	Compulsory
	Total	20	30	

Semester 2

Code	Course	Credit	ECTS	Description
0205321200X	Religion Education	2	3	Compulsory
02053212008	Civics Education	2	3	Compulsory
02053232004	Inclusion Education	2	3	Compulsory
02053232002	Counseling Guidance	2	3	Compulsory
02053243005	Electricity and Magnetism	3	4.5	Compulsory
02053241034	Experiment of Electricity and Magnetism	1	1.5	Compulsory
02053243006	Series and Complex Number	3	4.5	Compulsory
02053243003	Basis of Statistics	3	4.5	Compulsory
02053242007	Astronomy	2	3	Compulsory
	Total	20	30	

Semester 3

Code	Course	Credit	ECTS	Description
02053142009	Physics Learning Technology	2	3	Compulsory
02053142025	Evaluation of Physics Learning	2	3	Compulsory
02053142011	Physics Learning Strategy	2	3	Compulsory
02053142012	Electromagnetics	3	4.5	Compulsory
02053142013	Wave	3	4.5	Compulsory
02053142014	Mechanics	3	4.5	Compulsory
02053142015	Differential and Integral Vectors	3	4.5	Compulsory
02053142016	Analog Electronics	2	3	Compulsory
02053141035	Experiment of Analog Electronics	1	1.5	Compulsory
02053143017	Animation Media of Physics Learning	3	4.5	Compulsory
	Total	24	36	

Semester 4

Code	Course	Credit	ECTS	Description
02053242018	Digital Class Management	2	3	Compulsory
02053242019	Thermodynamics	2	3	Compulsory
02053243020	Introduction to Solid Physics	3	4.5	Compulsory
02053243021	Modern Physics	3	4.5	Compulsory
02053241036	Experiment of Advance Physics	1	1.5	Compulsory
02053243022	Special Function and Matrix Vector Space	3	4.5	Compulsory
02053242024	Digital Electronics	2	3	Compulsory
02053241037	Experiment of Digital Electronics	1	1.5	Compulsory
02053243010	Planning Physics Learning	3	4.5	Compulsory
02053242032	Optics	2	3	Compulsory
02053242026	Introduction to Computation and Numerical Methods	2	3	Compulsory
02053242018	Digital Class Management	2	3	Compulsory
	Total	24	36	

Semester 5

Code	Course	Credit	ECTS	Description
02053143023	Quantum Physics	3	4.5	Compulsory
02053143027	Statistical Physics	3	4.5	Compulsory
02053143028	Research Methodology	3	4.5	Compulsory
02053143030	Introduction to Nuclear Physics	3	4.5	Compulsory
02053143031	English for Physics	3	4.5	Compulsory
02053112001	Entrepreneurship	2	3	Compulsory
02053152022	Evaluation of Educational Programs	2	3	Elective
02053152021	Scientific Writing	2	3	Electuve
02053152012	Partial Differential Equation and Complex Number	2	3	Elective
02053152001	Physics Teaching Management	2	3	Electuve
02053152020	Optoelectronics	2	3	Elective
02053152005	Energy Conversion	2	3	Electuve
02053152006	Electronics Work	2	3	Elective
02053152007	Astrophysics	2	3	Electuve
02053152026	Marketing plan	2	3	Elective
02053152029	Industrial Internship	2	3	Electuve

02053152009	Development of Physics Teacher Profession	2	3	Elective
02053152019	School Management	2	3	Electuve
02053152010	Material Physics	2	3	Elective
02053152017	Physics Vocational High School	2	3	Electuve
02053152018	Electrodynamics	2	3	Elective
02053152002	Integrated Natural Science	2	3	Electuve
02053152008	Introduction to Earth and Disaster	2	3	Elective
02053152027	Biophysics	2	3	Electuve
02053152028	Energy Storage	2	3	Elective
02053152013	Dynamics of Teaching Media	2	3	Electuve
02053152003	Teaching Media Based On Computer	2	3	Elective
02053152004	Physics Learning Assessment	2	3	Elective
02053152030	Teaching Media Based on Educational Toys	2	3	Electuve
02053152015	Applied Statistics	2	3	Elective
02053152023	Teaching of National Science Olympic	2	3	Electuve
02053152025	E-Commerce	2	3	Elective
Total		43	64.5	

Semester 6

Code	Course	Credit	ECTS	Description
02053243032	Physics Laboratory	3	4.5	Compulsory
02053242029	Microteaching	2	3	Compulsory
02053252022	Evaluation of Educational Programs	2	3	Elective
02053252021	Scientific Writing	2	3	Electuve
02053252012	Partial Differential Equation and Complex Number	2	3	Elective
02053252001	Physics Teaching Management	2	3	Electuve
02053252020	Optoelectronics	2	3	Elective
02053252005	Energy Conversion	2	3	Electuve
02053252006	Electronics Work	2	3	Elective
02053252007	Astrophysics	2	3	Electuve
02053252026	Marketing plan	2	3	Elective
02053252029	Industrial Internship	2	3	Electuve
02053252009	Development of Physics Teacher Profession	2	3	Elective
02053252019	School Management	2	3	Electuve
02053252010	Material Physics	2	3	Elective

Code	Course	Credit	ECTS	Description
02053252017	Physics Vocational High School	2	3	Electuve
02053252018	Electrodynamics	2	3	Elective
02053252002	Integrated Natural Science	2	3	Electuve
02053252008	Introduction to Earth and Disaster	2	3	Elective
02053252027	Biophysics	2	3	Electuve
02053252028	Energy Storage	2	3	Elective
02053252013	Dynamics of Teaching Media	2	3	Electuve
02053252003	Teaching Media Based On Computer	2	3	Elective
02053252004	Physics Learning Assessment	2	3	Elective
02053252030	Teaching Media Based on Educational Toys	2	3	Electuve
02053252015	Applied Statistics	2	3	Elective
02053252023	Teaching of National Science Olympic	2	3	Electuve
02053252025	E-Commerce	2	3	Elective
Total		31	46.5	

Semester 7

Code	Course	Credit	ECTS	Description
02053126002	Internship Teacher Preparation	6	9	Compulsory
02053122001	Community Development Participations	2	3	Compulsory
02053152033	Management Laboratory	2	3	Compulsory
	Total	10	15	

Semester 8

Code	Course	Credit	ECTS	Description
02053226004	Thesis	6	9	Compulsory
	Total	6	9	

According to the programme website, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Informatics Education:

The objective of the BIE is to produce graduates with the following profile:

1. Professional attitude in the field of Information Technology and Computer Education, based on religious, legal, and social norms, academic ethics, and the noble values of the nation's culture, willingness to learn for life, and the ability to communicate effectively and work efficiently and responsibly both internally and externally. Alone or in a team

2. Able to apply logical, critical, innovative, quality, and careful thinking in carrying out types of work based on the results of information and data analysis in relation to scientific principles, procedures, and ethics, and able to apply Computers and Information Technology effectively and efficiently.3. Demonstrate high-level of professionalism, independent learning, and desire for life-long learning.

3. Mastering the skills to apply Computer and Information Technology in practical problem solving based on project management and business practices.

Programme Learning Outcomes:

PLO1: Able to apply knowledge based on local religious norms, laws, and social values.

PLO2: Showing Professional attitude in carrying out duties in accordance with roles and responsibilities.

PLO3: Showing Proper performance as an individual or as a part of team.

PLO4: Mastering broad and deep knowledge of the basic concepts of science and information technology.

PLO5: Mastering the common knowledge about basic education concepts, educational principles, learning to improve teaching quality.

PLO6: Reliable in effective communication skills

PLO7: Showing social awareness and sensitivity to disseminate ideas to the communities.

PLO8: Able to apply the knowledge and skills possessed to make the right decisions to teach concepts and practices in the field of Information Technology.

PLO9: Having advanced competence in developing curriculum, planning learning tools, and conducting learning assessments.

PLO10: Able to apply logical, critical, and innovative thinking systematically in designing and developing Information Technology.

PLO11: Having an in-depth understanding of engineering and science required to analyze and design Information Technology.

PLO12: Able to analyze actual issues and problems to provide solutions by utilizing technology

The following **curriculum** is presented:

SEMESTER 1

Code	Courses	Credit (SKS)	ECTS	Description
02163142001	Basic Multimedia / Basic Multimedia	2	3	Compulsory
02163141002	Praktikum Multimedia Dasar / Basic Multimedia Lab Work	1	1.5	Compulsory
02163142003	Sistem Operasi / Operating System	2	3	Compulsory
02163142004	Matematika untuk Ilmu Komputer 1 / Mathematic for Computer Science 1	2	3	Compulsory
02163141005	Praktikum Sistem Operasi / Operating System for Lab Work	1	1.5	Compulsory
02163142006	Pemrograman Terstruktur / Structured Programming	2	3	Compulsory
02163141007	Praktikum Pemrograman Terstruktur / Structured Programming Lab Work	1	1.5	Compulsory
02163142008	Komunikasi Data dan Jaringan Komputer / Communication and Computer Network	2	3	Compulsory
02163141009	Praktikum Komunikasi Data dan Jaringan Komputer / Communication and Computer Network Lab Work	1	1.5	Compulsory
02163132001	Ilmu Pendidikan / Educational Science	2	3	Compulsory
02163132002	Landasan Keilmuan PTK / Fundamental of Vocational Education	2	3	Compulsory
02163122005	Bahasa Inggris / English	2	3	Compulsory
02163112004	Bahasa Indonesia / Bahasa Indonesia	2	3	Compulsory
	Total Credit	22	33	

SEMESTER 2

Code	Courses	Credit (SKS)	ECTS	Description
02163242010	Basis Data / Database	2	3	Compulsory
02163241011	Praktikum Basis Data / Database Lab Work	1	1.5	Compulsory
02163242012	Algoritma dan Struktur Data / Algorithm and Data Structure	2	3	Compulsory
02163243013	Matematika untuk Ilmu Komputer 2 / Mathematic for Computer Science 2	3	4.5	Compulsory
02163242014	Administrasi Jaringan Komputer / Computer Network Administration	2	3	Compulsory
02163241015	Praktikum Administrasi Jaringan Komputer / Computer Network Administration Lab Work	1	1.5	Compulsory
02163241016	Fotografi / Photography	1	1.5	Compulsory
02163241017	Praktikum Fotografi / Photography Lab Work	1	1.5	Compulsory
02163241018	Desain Web / Web Design	1	1.5	Compulsory
02163241019	Praktikum Desain Web / Web Design Lab Work	1	1.5	Compulsory
02163232003	Profesi Kependidikan / Educational Profession	2	3	Compulsory
02163212001	Pendidikan Agama / Religious Instruction	2	3	Compulsory
02163212002	Pendidikan Pancasila / Pancasila	2	3	Compulsory
Total Credit		21	31.5	

SEMESTER 3

Code	Courses	Credit (SKS)	ECTS	Description
02163142020	Rangkaian Elektronika dan Instrumentasi / Electronic Circuit and Instrumentation	2	3	Compulsory
02163141021	Praktikum Rangkaian Elektronika dan Instrumentasi / Electronic Circuit and Instrumentation Lab. Work	1	1.5	Compulsory
02163142022	Teknik Animasi 2D / 2D Animation	2	3	Compulsory
02163141023	Praktikum Teknik Animasi 2D / 2D Animation Lab. Work	1	1.5	Compulsory
02163142024	Keamanan Jaringan Komputer / Computer Network Security	2	3	Compulsory
02163141025	Praktikum Keamanan Jaringan Komputer / Computer Network Security Lab. Work	1	1.5	Compulsory
02163142026	Pemrograman Berorientasi Objek / Object Oriented Programming	2	3	Compulsory
02163141027	Praktikum Pemrograman Berorientasi Objek / Object Oriented Programming Lab. Work	1	1.5	Compulsory
02163142028	English for IT / English for IT	2	3	Compulsory
02163142029	Pemrograman Web / Web Programming	2	3	Compulsory
02163141030	Praktikum Pemrograman Web / Web Programming Lab. Work	1	1.5	Compulsory
02163141031	Desain Grafis Percetakan / Graphic Design	1	1.5	Compulsory
02163141032	Praktikum Desain Grafis Percetakan / Graphic Design Lab. Work	1	1.5	Compulsory
02163132004	Stragtegi Belajar Mengajar / Teaching and Learning Strategies	2	3	Compulsory
02163112003	Pendidikan Kewarganegaraan / Civic	2	3	Compulsory
Total Credit		23	34.5	

SEMESTER 4

Code	Courses	Credit (SKS)	ECTS	Description
02163242033	Teknik Animasi 3D / 3D Animation	2	3	Compulsory
02163241034	Praktikum Teknik Animasi 3D / 3D Animation Lab. Work	1	1.5	Compulsory
02163242035	Jaringan Nirkabel / Wireless Network	2	3	Compulsory
02163241036	Praktikum Jaringan Nirkabel / Wireless Network Lab. Work	1	1.5	Compulsory
02163242037	Pemrograman Desktop / Desktop Programming	2	3	Compulsory
02163241038	Praktikum Pemrograman Desktop / Desktop Programming Lab. Work	1	1.5	Compulsory
02163243039	Statistik Terapan / Applied Statistic	3	4.5	Compulsory
02163243040	Rekayasa Perangkat Lunak / Software Engineering	3	4.5	Compulsory
02163232005	Perkembangan Peserta Didik / Learners Development	2	3	Compulsory
02163233006	Evaluasi Pendidikan / Learning Evaluation	3	4.5	Compulsory
02163132008	Pengelolaan Kelas Digital / Digital Class Management	2	3	Compulsory
02163222006	Bimbingan dan Konseling / Guidance and Counseling	2	3	Compulsory
	Total Credit	24	36	

SEMESTER 5

Code	Courses	Credit (SKS)	ECTS	Description
02163142041	Organisasi Sistem Komputer / Computer System Organization	2	3	Compulsory
02163141042	Praktikum Organisasi Sistem Komputer / Computer System Organization Lab. Work	1	1.5	Compulsory
02163142043	Desain Multimedia Interaktif / Interactive Multimedia Design	2	3	Compulsory
02163141044	Praktikum Desain Multimedia Interaktif / Interactive Multimedia Design Lab. Work	1	1.5	Compulsory
02163142045	Pemrograman Perangkat Bergerak / Mobile Computing	2	3	Compulsory
02163141046	Praktikum Pemrograman Perangkat Bergerak / Mobile Computing Lab. Work	1	1.5	Compulsory
02163142047	Rancang Bangun Jaringan Komputer / Computer Network Engineering	2	3	Compulsory
02163143048	Metodologi Penelitian / Research Method	3	4.5	Compulsory
02163142049	Data Mining / Data Mining	2	3	Compulsory
02163132007	Perencanaan Pembelajaran / Instructional Planning	2	3	Compulsory
02163122003	Kewirausahaan / Enterpreneurship	2	3	Compulsory
02163132011	Teknologi Pembelajaran / Instructional Technology	2	3	Compulsory
02163122008	Pendidikan Inklusi / Inclusive Education	2	3	Compulsory
	Total Credit	24	28.5	

SEMESTER 6

Code	Courses	Credit (SKS)	ECTS	Description
02163243050	Praktik Industri / Industrial Internship	3	4.5	Compulsory
02163232009	Microteaching / Microteaching	2	3	Compulsory
02163242052	Sertifikasi Kompetensi / Competence Certification	0	0	Compulsory
02163222001	Kuliah Kerja Nyata / Community Service	2	3	Compulsory
02163252001	Robotika / Robotics	2	3	Elective
02163252002	Teknologi E-Bisnis / E-Business Technology	2	3	Elective
02163252003	Jaringan Sensor Nirkabel / Wireless Sensor Network	2	3	Elective
02163252004	Internet of Thing / Internet of Things	2	3	Elective
02163252005	Teknik Pengolahan Audio Video / Audio & Video Processing	2	3	Elective
02163252006	Pemrograman Game 2D / 2D Game Programming	2	3	Elective
02163242054	Seminar Proposal / Undergraduate Thesis Proposal Seminar	2	3	Compulsory
02163252015	Kecerdasan Buatan untuk Pendidikan / Artificial Intelligence for Education	2	3	Elective
02163252019	Teks Mining / Text Mining	2	3	Elective
02163252016	Visi Komputer / Computer Vision	2	3	Elective
02163252020	Keamanan Siber / Cyber Security	2	3	Elective
02163252017	Transformasi Digital / Digital Transformation	2	3	Elective
	Total Credit	31	46.5	

SEMESTER 7

Code	Courses	Credit (SKS)	ECTS	Description
02163134010	Pengenalan Lapangan Persekolahan / School Introductory	4	6	Compulsory
02163142053	Penulisan Karya Ilmiah / Academic Writing	2	3	Compulsory
02163252014	Gamifikasi / Gamification	2	3	Elective
02163152007	Komputasi Awan / Cloud Computing	2	3	Elective
02163152008	Seni dan Desain Game Digital / Game Digital Art & Design	2	3	Elective
02163152009	Teknik Efek Visual Video / Visual and Video Effect	2	3	Elective
02163152010	Animasi 3D Lanjut / Advance 3D Animation	2	3	Elective
02163152011	Pemrograman Web Lanjut / Advance Web Programming	2	3	Elective
02163152012	Pengembangan Software Edukasi / Educational Software Development	2	3	Elective
02163152018	Big Data / Big Data	2	3	Elective
02163152013	Pemrograman Game 3D / 3D Game Programming	2	3	Elective
	Total Credit	24	36	

SEMESTER 8

Code	Courses	Credit (SKS)	ECTS	Description
02163226004	Skripsi / Undergraduate Thesis	6	9	Compulsory
	Total Credit	6	9	