ASIIN Seal

Accreditation Report

Bachelor's Degree Programme
Computer Science

Provided by
Universitas Lampung, Indonesia

Version: 24 September 2024

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]
S1 Ilmu Komputer	Bachelor Programme in Computer Science	ASIIN	BAN-PT[3]: 2021 - 2026	04
Date of the contract: 16.11.2021 **Submission of the final version of the self-assessment report:** 23.06.2023 **Date of the audit (online):** 10.10-12.10.2023				
Expert panel: Prof. Dr. Markus Esch, University of Applied Sciences Saar Luka Giorgadze, Group Engineering Manager at Tado GmbH Luft Kettenbeil, Student at Göttingen University Dr. Ir. Shofwatul Uyun, Universitas Islam Negeri Sunan Kaljaga				
Representative of the ASIIN headquarters: Daniel Seegers & Astrid Hartmann				
Responsible decision-making committee: ASIIN Accreditation Commission				
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 10.12.2015				

[1] ASIIN Seal for degree programmes;

[2] TC: Technical Committee for the following subject areas: TC 04 – Informatics/Computer Science

[3] National Accreditation Board of Higher Education / Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT)

Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science of 29.03.2018	

B Characteristics of the Degree Programme

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF[4]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Bachelor's Programme in Computer Science	S.Kom (Sarjana Komputer) / B.Sc.	Artificial Intelligence Information Systems Software Engineering	6	Full time	None	8 Semesters	144 SCU / 230.4 ECTS	Annual/ 2005

[4] EQF = The European Qualifications Framework for Lifelong Learning

For the Bachelor's degree programme under review, Universitas Lampung (UNILA) has presented the following profile in its Self-Assessment Report:

Computer Science
Vision
Becoming a Computer Science program that excels in education and research in the field of computer and information technology, and achieving success at the national and international level.
Mission
1. To provide education in the field of computer science that is relevant to the needs and potential of Lampung province, at the national and international level.
2. To develop and advance research in the field of computer and information technology, and to utilise its results for the benefit of the surrounding environment and the well-being of humanity.
3. To increase the use of computer and information technology for the community through community service activities.
4. To develop mutually beneficial partnerships with external parties in order to develop the three main functions of higher education (teaching, research, and community service).

C Expert 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
- Module Handbook
- Homepage Ba Computer Science
- Homepage UNILA
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The auditors base their assessment of the learning outcomes on the information provided on the website and in the Self-Assessment Report including all appendices for the Bachelor's degree programme Computer Science.

UNILA has defined and published Course Learning Outcomes (CLO) as well as Programme Learning Outcomes (PLO), which cover a number of specific competences students should acquire in the course of their studies. The PLO comprise four areas of competence, i.e. attitudes, general skills, special skills, and knowledge.

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

Graduates of the Computer science degree programme should be able to contribute to a high-quality solution of problems in almost all fields of application of computer science in cooperation with experts from these fields. They should convey knowledge of complex problem solving and be able to further develop concepts, methods, procedures, etc. of

computer science. Graduates should possess a broad spectrum of fundamental and specialist knowledge, be up-to-date on current developments in their subject area, and be able to place their knowledge and skills in a larger context.

According to the Self-Assessment Report, the Computer Science degree programme enables graduates to work with formal methods of problem-solving, algorithm development, mathematical concepts, and their application to real-world problems. Furthermore, students develop the skills necessary to plan, design, implement, and manage complex software systems and software, including project management tools and methodologies. Technical competencies are also developed in courses in the latest technologies and programming languages, such as C++. The curriculum also focuses on developing transferable skills such as problem-solving, critical thinking, and communication skills, as well as interdisciplinary thinking across a range of fields and disciplines.

The programme is designed as a general Computer Science programme with some specialisation options in elective modules and particularly in the course of the final research project. The programme's educational objectives and learning outcomes are expected to equip the graduates with the life skills required to develop and adapt to the wide spectrum of possible occupations.

Graduation Profiles and Occupations

Graduates of the programme have a broad occupational area. Their occupational profile includes researcher, lecturer, and entrepreneur ("technopreneur"), and they could work in industry, academia, or public institutions. As junior research assistants, graduates should be able to examine issues in Computer Science by implementing the newest scientific and technological methods and be able to design and execute research projects. As technopreneurs, graduates should be sufficiently qualified to manage a business unit and to develop local, Computer Science-based business ideas through innovation and creativity.

Technopreneur is one of the graduate profiles identified by the programme to satisfy the needs of the job market. The other 5 other graduate profiles are IT/IS Consultant, Programming and Software Developer, Data Scientist, Database Administrator, and Intelligence System Analyst. For these profiles, the program aims to develop competencies such as professional ethics and morals, understanding and explaining the workings of computer systems, analysing and developing models for solutions for computer-based problems, designing and developing software, general and entrepreneurial insights, and knowledge of the IT industry. Below are the graduate profiles and their respective descriptions:

No.	Career Opportunity	Description
1	Technopreneur	A technopreneur is someone who has the ability to develop and manage information technology businesses. They have the ability to identify new business opportunities in the field of information technology and capitalize on them in innovative ways.
2	IT/IS Consultant	An IT/IS consultant is someone who provides advice and solutions to companies or organizations on how to use information technology to improve their efficiency and productivity. They have the ability to analyze a company's information technology needs and develop appropriate solutions.
3	Programming and Software Developer	A programming and software developer is someone who has the ability to design, develop, and code software applications. They have the ability to understand programming languages and use them to create useful and efficient applications.
4	Data Scientist	A data scientist is someone who has the ability to collect, analyze, and interpret large data sets. They have the ability to use statistical and machine learning tools and techniques to find useful patterns and information from data.
5	Database Administrator	A database administrator is someone who is responsible for managing a company's databases. They have the ability to organize and optimize databases to function efficiently, as well as ensure the security and integrity of data.
6	Intelligence System Analyst	An intelligence system analyst is someone who has the ability to analyze artificial intelligence systems and develop solutions to improve their performance. They have the ability to understand how artificial intelligence systems work and identify areas that can be enhanced.

Source: Self-Assessment Report UNILA Bachelor Programme Computer Science (2023)

Supplementing the subject-related qualification objectives, students of the Computer Science programme should have adequate competences (‘soft skills) in oral and written communication skills, presentation skills, business awareness, negotiation skills, be capable of working autonomously as well as in a team-oriented manner, and be able to conduct research activities. Furthermore, they should have trained their analytical and logical

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

Conclusions

In summary, the experts are convinced that the intended qualification profile of the Computer Science bachelor programme allows graduates to take up an occupation that corresponds with their qualification. The mapping of CLOs and PLOs is a good concept for managing the degree. The objectives and intended learning outcomes are reasonable and well-founded.

The degree programme is designed in a manner that aligns with its intended goals. However, the experts have raised a concern regarding the Computer Science programme's ambitious vision of excelling in research and achieving international success, suggesting that it might be overly ambitious at its current stage. The recommendation from the experts is to shift the programme's focus towards making a meaningful impact on society, as this vision appears to be more achievable and closely aligned with the programme's current status and the expectations of its stakeholders.

The experts conclude that the objectives and intended learning outcomes of the Bachelor's degree programme in Computer Science adequately reflect the intended level of academic qualification and correspond sufficiently with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 04 – Informatics/Computer Science.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the experts:
The experts confirm that the English translation and the original Indonesian name of the study programme under review correspond with the intended aims and learning outcomes as well as the main course language (Bahasa Indonesia).

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plan
- Module Handbook
- Curriculum Book

- MBKM Guidebook
- Tracer Study 2020
- Homepage Ba Computer Science
- Homepage UNILA
- Discussions during the audit

Preliminary assessment and analysis of the experts:
The Bachelor's programme Computer Science is offered by the Faculty of Mathematics and Natural Sciences (FMIPA), which is one of the eight faculties at the University of Lampung.

Curriculum structure

In order to graduate, Computer Science students have to pass a minimum of 144 credits (Satuan Kredit Semester/Semester Credit Units SCU) within a period of eight semesters (four years). This is equivalent to 230.4 ECTS points. The maximum length of study for undergraduate programmes at UNILA is 14 semesters (seven years). Each semester is equivalent to 14 weeks of learning activities. Besides these learning activities, there is one week for midterm exams and one week for final exams. The odd semester starts in August and ends in January of the following year, while the duration for the even semester is from February to July.

The curriculum consists of university course requirements as well as a number of compulsory and elective courses determined by UNILA and the respective departments. University course requirements are courses that need to be attended by all undergraduate students at UNILA. There are five university requirements: Bahasa Indonesia, Religion, Pancasila, Ethics, and Civic Education. These courses are almost all offered in the first two semesters of studies, in addition to courses conveying basic knowledge of programming, information and operating systems, statistics, and mathematics.

The course distribution is depicted in the following table:

No	Modules	Credits	Percentage	ECTS
1	University	8	5.56%	12.8
2	Faculty	2	1.39%	3.2
3	Programme	106	73.61%	169.6
4	Election	28	19.44%	44.8
Total Credits		144		230.4

Source: UNILA Self-Assessment Report: Table 1.1 Modules Composition

Courses on the different subject-specific sciences are offered from the third to the eighth semester. Elective courses can be taken from the third semester of study. Students usually choose elective courses that relate to their research projects, thesis, and/or their individual interests. During the eight semesters, students must also complete the internship (3 SCU), the research proposal (1 SCU), the research result (1 SCU), the undergraduate thesis (4 SCU), and the community service (3 SCU).

Programme content

The Computer Science programme teaches students the fundamentals of programming languages, data analysis, problem-solving methodologies and models, and mathematical concepts. The first two semesters focus on introductory courses and mandatory university courses such as basic science, religious education, civic education, or Indonesian language education. Hereafter, the curriculum focuses on more in-depth topics such as structured and object-oriented programming, data structure and algorithms, artificial intelligence, machine learning, or natural language processing.

The experts advise postponing the introduction of Software Engineering to a later semester, preferably the 3rd or 4th. This strategic adjustment would provide students with the opportunity to establish a solid foundation by mastering essential fundamentals before delving into the complexities of Software Engineering. This approach is expected to enhance the students' overall comprehension and readiness to tackle the subject, ensuring a smoother and more effective learning experience.

Community Service

Usually during the last year of studies, students must complete the community service (Kuliah Kerja Nyata, KKN). It has a minimum length of 40 working days and often takes place in villages or rural areas where students stay and live together with the local people. The course is designed “to allow students to apply their knowledge based on their field in order to empower society”. Since the community service usually takes place in remote areas, the students cannot attend any classes during this time. The students work in interdisciplinary teams during the community service in order to advance society and bring further development. This course was introduced at all Indonesian Universities in 1971. The assessment of the community service consists of a work plan, programme implementation, and activity report. The experts understand that students should work for the benefit of the community and Indonesian society during the community service and support this concept.

Academic Leave

Students who have strong reasons such as illness or pregnancy, are entitled to take academic leave for a maximum of two semesters without paying tuition and still counting as the study period. Academic leave is proposed by students to the Dean, who then submits a proposal for academic leave to be determined administratively by the Rector's Office.

Internship

The Computer Science programme includes an internship of 4-6 months, which can be converted to a maximum of 20 credits (32 ECTS). The actual length may vary, depending upon the agreement between the undergraduate programme and the host institution. The internship can be conducted in research institutions, public institutions or companies. Students can get information about available places from the programme coordinators, the UNILA Career Center, or the internship supervisor and need to submit an internship proposal (learning plan). The industrial internship is part of the national MBKM program (Freedom to Learn - Independent Campus), which allows students the freedom to learn within and outside the program. Students are also required to complete practical work for 30 working days in semester 6 (3 credits as part of the total of 20 credits).) According to the Self-Assessment Report, the relevance and quality of the internship are assured by aligning the internship location with the Computer Science qualifications, determining the length of the internship, and regularly monitoring the implementation of the internship.

English Language Skills

Since UNILA has the ambition to become internationally more visible and wants to further internationalise its degree programmes, the experts inquire if any classes are taught in English. The programme coordinators explain that usually all courses are delivered in Bahasa Indonesia (Indonesian language) but most of the teaching materials (mainly the books, guides, and tutorials) are provided in English and some presentations by students are also delivered in English. Furthermore, students should be encouraged and supported to attend summer courses that are held in English with international students and guest lecturers. The experts acknowledge that there is an English Club in the Department of Computer Science, which is a forum for students who have an interest in developing their English language skills with respect to conversational skills, writing, and reading.

Based on the feedback received from students during the audit, the experts recommend that the programme should explore additional opportunities to enhance the English communication skills of both faculty members and students. This initiative could significantly contribute to the development of international skills, create more job opportunities, and enhance overall recognition and acceptance in the global market.

Industry Involvement

The last Tracer Study shows that out of 70 alumni who returned the questionnaire, 29 work in local companies, while most graduates (55) work in national companies. 7 of them work in multinational companies. Out of these alumni, 42% indicated that the knowledge from the programme relates to their current job.

Industry representatives would like to see more soft skills taught to students such as project management skills, negotiation skills, presentation skills, or communication skills to help them perform better or adapt more quickly to the work environment, but also to be more competitive in the job market. Students have expressed the same sentiment; they would like to see more soft skills taught in the programme. Industry partners would also like to see more workplace awareness in the students, so they understand the business perspective. The experts agree with this assessment. Furthermore, the expert ask whether the attending industry or public institution representatives were involved in the development of the curriculum of the programme. While seemingly strong connections exists, none of the attending representatives states that they were involved in the development nor did they know how the perspective of the outside job world is reflected in the curriculum development process. Therefore the experts urge UNILA to include the labor market perspective for example in terms of and advisory board on the faculty level or an otherwise institutionalized working group that makes it possible to share helpful insights.

Furthermore, the experts emphasise the necessity of ensuring industry or public institution involvement in the program curriculum development. Despite the potential for strong connections, none of the attending representatives has affirmed their participation in the development process, nor have they demonstrated a clear understanding of how the program reflects external job market perspectives.

In view of this, the experts urge UNILA to integrate the labour market perspective into the curriculum development process. This integration should be achieved through means such as the establishment of an advisory board at the faculty level or the creation of an institutionalised working group, among other flexible approaches. These measures will be essential to facilitate the exchange of valuable insights and ensure a mandatory and harmonious alignment between the program and the expectations of the external job market.

Conclusions

In summary, the auditors gain the impression that the programme is well-organized. Graduates of the Computer Science programme under review are well prepared to enter the labour market and can find adequate jobs in Indonesia. During the discussions, UNILA's partners from the industry/public sector confirmed that the graduates have a broad

scientific education, are very adaptable, and have manifold competences, which allows them to find adequate jobs. However, both industry representatives and students expressed the desire to include more soft skills in the curriculum in order to understand business perspectives and interests and to be better equipped to work in an organisational environment. The experts also point out that industry partners should be included more systematically in the curriculum development process and that the programme should extend collaboration with industry on other aspects, such as job fairs or guest speakers.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Study plan
- Curriculum Book
- Student Admission Document
- Homepage Ba Computer Science
- Homepage UNILA
- Discussions during the audit

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

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

1. National Selection of State Universities (Seleksi Nasional Masuk Perguruan Tinggi Negeri, SNMPTN), a national admission system, which is based on academic performance and non-academic achievements during the high school period. Selection is in February/March.

2. Joint Selection of State Universities (Seleksi Bersama Masuk Perguruan Tinggi Negeri, SBMPTN). This national selection test is held every year for university candidates. It is a nationwide online test (subjects: Mathematics, Bahasa Indonesia, English, Physics, Chemistry, Biology, Economics, History, Sociology, and Geography). Selection is March-July.

3. Independent Selection for State University (SMMPTN) where students are selected based on a computer-based written exam held by Western Region Public Universities (BKS PTN). Selection is July-August.

4. Student Acceptance of Education Access Expansion (PMPAP) which is a student acceptance path managed by UNILA for students who cannot afford tuition fees.

The Higher Education Entrance Exam Institute (Lembaga Tes Masuk Perguruan Tinggi, LTMPT) carries out the process of student data collection, registration, and implementation of university entrance selection in Indonesia on the national level. At UNILA, the New Student Admissions Management Agency (Badan Pengelola Penerimaan Mahasiswa Baru, BP PMB) is in charge of carrying out the admission procedure. All information about the requirements, how to register, the stages of the registration process, exam schedules, and the announcement of selection results are managed by this agency. All information that is under the responsibility of UNILA can be accessed by the public via the Internet.

For international student admission, there is a Foreign Cooperation Student Selection process which is conducted from January-July, which includes the requirement that all students (national and international) must have graduated from high school not longer than 3 years prior.

Undergraduate students at UNILA have to pay tuition fees (UKT) each semester. The fees for each study programme vary according to the operational costs of learning. In addition, UKT for each student is different according to the financial ability of their parents. Students with a very poor economic background do not have to pay any tuition fees (class I) and the highest tuition fee (class 8) is IDR 7,950,000 (EUR 506) per year.

In addition to the PMPAP (see nr 4. above), several grants are available for students with financial difficulties, such as from the government, industries, and foundations.

Conclusions

In summary, the auditors find the terms of admission to be binding and transparent, confirming that the admission requirements support the students in achieving the intended learning outcomes. However, to enhance its international recognition, the experts recommend that UNILA establishes a specialized admissions system for foreign students, prioritizing a seamless application process and comprehensive support services. This proactive approach will contribute to greater global appeal and inclusivity, further solidifying UNILA's reputation on the international stage.

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

1.1

UNILA has conveyed its intention to explore adjustments to its vision and has articulated plans to actively engage stakeholders in the developmental and curriculum evaluation

processes. The experts commend UNILA's well-structured action plan and are enthusiastic about witnessing the successful implementation of these anticipated changes in the near future.

1.3

UNILA has affirmed its commitment to consider the recommendations of the experts concerning the position of the Software Engineering course, with plans to implement changes in the upcoming semester in 2024. Additionally, UNILA has outlined existing programs aimed at enhancing students' English proficiency. While the experts commend UNILA for these initiatives, they emphasize the potential benefits of offering more courses in English, providing a uniform advantage to all students and not relying on specific activities that some students may not engage in.

1.4

UNILA asserts the existence of its admission system and provides support to students in visa applications, along with orientation programs designed to facilitate the integration of foreign students into the academic system. The experts find these measures to be satisfactory.

In summary the experts consider criterion 1 largely fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and Modules

Evidence:

- Self-Assessment Report
- Study plans
- Module Handbook
- Curriculum Book
- MBKM Guidebook
- Homepage Ba Computer Science
- Homepage UNILA
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The Bachelor's degree programme in Computer Science requires students to complete 144 credits (230.4 ECTS), which includes compulsory courses (216 credits/185.6 ECTS) and a minimum of 28 credits (44.8 ECTS) of elective courses. The curriculum is designed for eight semesters. However, it is also possible for excellent students to complete the degree in only seven semesters by adding additional courses. Students cannot take more than 24 credits per semester. All students have to complete the undergraduate programme within seven years (14 semesters). The students' individual study plans differ from each other and have to be approved by their academic advisors.

Program structure

Courses in the first two semesters include general mandatory courses and basic knowledge of computer science courses. From the third semester on, more subject-specific classes are offered (see chapter 1.3). Elective subjects are offered from the third semester and are designed to not only complement the compulsory courses but also to help students decide on a final project and personal scientific interest. Higher semester courses are a continuation of the previous foundational courses in earlier semesters (hierarchical structure).

The 6th semester introduces the final thesis in the research methodology course and offers thesis themes from lecturers through Capita Selecta course in semester 7 so that students can prepare their research proposal seminar by the end of that semester. During the seventh and eighth semesters, students must complete the Community Service and the Bachelor's thesis.

The compulsory courses in the final year include Capita Selecta (2 credits), Special Task (1 credit), Community Service (3 credits), Research Proposal (1 credit), Research Result (1 credit), and the Thesis/Final Project (4 credits). In addition, students have to take a minimum of 18 credits in electives.

Internship

The internship course is designed to strengthen the students' social and practical competences and to increase their chances in the job market. The Students Internship Course (SIC, in Bahasa: Kuliah Magang Mahasiswa (KMM)) or Fieldwork Practices (FP, in Bahasa Indonesia: Praktek Kerja Lapangan (PKL)) is a practice-based and non-theoretical course. It is designed to implement the theories learned during the course of studies into field practices or within partners' institutions. The programmes provide an Internship Guidebook (MBKM Guidebook) for informing students about the goals and content of the internship course. UNILA awards 3 credits for the internship, which is carried out for at least

30 working days at an external institution. Students are required to submit a written work report, which is evaluated by the supervisor from the external institution and by one lecturer from UNILA.

Thesis

The members of the teaching staff explain at the request of the experts that they offer possible topics for the final projects according to their own research projects. All members of the teaching staff supervise Theses. Students have to design a research proposal with a time schedule for the project, which is discussed with the academic advisor. If they approve, students apply formally to be allowed to work on the suggested topic. Students can also develop their own concepts for their Bachelor's thesis and it is possible to conduct the Bachelor's Thesis outside UNILA. The experts note the high quality of the Theses presented as part of the Self-Assessment Report.

Conclusions

After analysing the module descriptions and the study plans, the experts confirm that the programme is divided into modules and that each module is a sum of coherent teaching and learning units. The course contents are comprehensive and sufficient. All practical work and internships are well integrated into the curriculum and the supervision by UNILA guarantees their respective quality in terms of relevance, content, and structure.

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

International Mobility

UNILA provides some opportunities for students to conduct internships and exchange programmes abroad. Students who participate in student exchanges through cooperation programmes can gain recognition of the acquired credits after obtaining approval from their undergraduate programme. The credits acquired abroad are transferable to UNILA, although this transfer of credits is only possible if an agreement exists between UNILA and the involved international university. This agreement regulates the details of the transfer, such as the list of courses that can be transferred, the minimum grade, equivalency of curriculum between universities, etc.

Students' international academic mobility is supported by UNILA. For example, through the International Students Mobility Awards (IISMA), a scholarship programme from the Ministry of Education and Culture starting in 2021. Four students from UNILA were

awarded an IISMA scholarship in 2022, but none of these were from the Computer Science Programme. In addition, lecturers are encouraged to carry out joint research activities with international partners and to involve students in their projects.

To promote academic mobility UNILA has an International Office, where students can get information about academic mobility. It also offers a website and a Facebook page, which provide information such as the requirements that students need to know before applying for one of the exchange programmes. In addition, one of UNILA's strategies to promote international student mobility is to provide scholarships for international students. However, there are only very few non-Indonesian students at UNILA. According to the information provided in the self-assessment report, the Computer Science programme hosted 1 international student each year in 2019, 2020, and 2021 (Table 5.1 Performance Indicators of Computer Science Programme). In 2018, one Malaysian student from Kanawaza University in Japan participated in a 5-day International Bioinformatics Training.

The new policy of the Indonesian government actively supports any activities outside of the university by publishing a regulation on the Merdeka Belajar-Kampus Merdeka (MBKM), which requires the university to promote students who want to spend part of their Bachelor's programme outside UNILA (Minister of Education and Culture Regulation Number 3, 2020).

The **MBKM programme** allows students to gain up to 20 credits that will be converted into specific course learning outcomes. MBKM learning can be implemented in class in semesters 1-8, and outside of class from semester 5 onwards (with the exception of student exchange, this is also possible in semester 4). The MBKM programme offers the students the following possibilities of learning (Table 1.2 in Self-Assessment Report):

A. Internship in Industry,
B. Research,
C. Independent Project/Study
D. Student exchange,
E. Entrepreneurship,
F. Village Project,
G. Humanitarian Project.

MBKM is not mandatory like PKL and KKN. Students must consult with their academic supervisor in determining the MBKM programme and its relevancy to their studies and fill out a Learning Agreement.

The number of credit points that can be gained by students by participating in one of the seven activities in the MBKM programme for one semester depends on the workload of

the student. Full-time means that students leave campus for one semester without attending regular lectures. Part-time means students only use their spare time between academic activities on campus for MBKM activities.

The students confirm during the discussion with the experts that some opportunities for international academic mobility exist, mostly with universities in South East Asia. However, they also point out that they wish for more places, more exchange programmes, and more scholarships. So far, the main obstacles that are limiting students' academic mobility are the language barrier and financial restrictions (high living costs). The available scholarships also require a high IELTS/TOEFL score, which is not only challenging for the students but also expensive to obtain. Currently, most stays abroad are short-term stays, either for attending workshops or for taking part in seminars for a few weeks. Longer stays in the course of exchange programmes (one semester or longer) are very rare. The lack of financial support hinders students from joining the outbound programmes. National scholarships are available, but they are highly competitive, so only a few students receive them. In addition, students would like to improve their English proficiency in order to increase their international job perspectives and their chances of receiving a scholarship for continuing their academic education at an international university.

The experts support these suggestions and recommend increasing the efforts to further internationalise UNILA by establishing more international cooperations and exchange programmes, and offering more scholarships. Students would also benefit from more and better communication about the opportunities available to them, including application procedures and deadlines. Furthermore, UNILA could invite more visiting lecturers, initiate more international exchange programmes, and provide more scholarships for students. The experts emphasise that it is very useful for students to spend some time abroad during their Bachelor's studies to improve their English proficiency, broaden their scientific background, and increase their job opportunities. It is advised to consider offering their own English examination to support students in obtaining the required IELTS or TOEFL scores.

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

Conclusions

In summary, the experts appreciate the effort to foster international mobility and support UNILA to further pursue this path. However, the academic mobility is still low and there is room for improvement, as described above.

Criterion 2.2 Workload and Credits

Evidence:

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

Preliminary assessment and analysis of the experts:
Based on the Rector's Regulation of the University of Lampung Number 19 of 2020 concerning Academic Regulations OR National Standards for Higher Education of Indonesia (SNPT), the Bachelor's degree programme uses a credit point system called SCU (Semester Credit Units)

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

- 50 minutes of scheduled contact with the teaching staff in learning activities,
- 60 minutes of structured activities related to lectures, such as doing assignments, writing papers, or studying literature,
- 60 minutes of independent activities outside the classroom to obtain a better understanding of the subject matters and to prepare academic assignments such as reading references.

For (computer) lab work, the final Thesis/project, fieldwork, and other similar activities 1 SCU is equivalent to 3 to 5 hours a week of student activities. The student credit load per semester is also adjusted considering the student's achievement (GPA score) in the previous semester. This decision is made in consultation with the academic advisor. The details and the students' total workload are described in the respective module descriptions.

In comparison to the ECTS credit system, wherein 1 ECTS equals 25-30 hours of students' workload, it is determined that 1 credit point is awarded for 170 minutes of work per week. One semester usually consists of 14 lecture meetings. The students' workload (contact hours and self-studies) is measured in Indonesian credit points (SCU/SKS) and converted to the European Credit Transfer System (ECTS). According to the legal requirements, the actual number is 144 SCU (229 ECTS) for the Bachelor's degree programme.

Workload

The students' workload is high, especially in the first two semesters, because students have to adjust to the new learning environment and the transition from high school to university

can be challenging. The workload of the last two semesters is markedly reduced to give the students enough time for their thesis as well as to start looking for a job. The effective number of credits that students may take per semester depends on their Grade Point Average (GPA), yet the maximum amount of credit points is 24. This mechanism is to ensure that the students can really handle the workload. It also means that, theoretically, students can finish their studies in less than 8 semesters. The experts confirm that the distinction between classroom work and self-studies is made transparent and is in line with the credits awarded. However, the experts note that the curriculum consists of many small modules and recommend merging some of the modules in order to reduce the exam load of the students. Especially in the first two semesters students are still adjusting to new ways of teaching and learning and should not be overloaded during that time.

The students confirm that the workload is high but manageable. They are still able to take part in student associations and have time for family, friends, and hobbies. In addition, the experts note that the average length of study is not critically exceeded, which means that most students graduate on time (within 3.87, 4.15, and 3.92 years in 2019, 2020, and 2021 respectively, see Table 5.1 of the Self-Assessment Report). The drop-out rate has been at zero from 2016-2021, and 3 in 2022.

This verifies that the degree programme under review can be completed in the expected period.

Criterion 2.3 Teaching Methodology

Evidence:

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

Preliminary assessment and analysis of the experts:

The learning method applied in the Computer Science programme is a combination of teacher-centred learning (TCL) such as classroom teaching/tutorials, demonstrations, and computer laboratory sessions, and student-centred learning (SCL) such as seminars, Community Service, field studies, computer laboratory work, and Thesis. Each course can use one or a combination of several teaching and learning methods.

The most common methods of learning are lectures, with several courses having integrated computer laboratory work. Lecturers generally prepare presentations to support the teaching process. With individual or group assignments, such as discussions, presentations,

or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre- or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods.

Judging from the module handbook and discussions during the audit, the experts note that most modules are designed to impart knowledge in a classic face-to-face lecture format; online learning was applied intensively during the COVID-19 pandemic. Online learning also utilises various media such as WhatsApp, Google Classroom, or Zoom. Restrictions on practical activities during the pandemic have constrained laboratory work. In response to this situation, simulations were performed in the laboratory and the video demonstration was then discussed online with the students. In addition to demonstrations, several experimental learning videos from various websites were presented.

The Computer Science programme does not offer an international class; the main teaching language is Bahasa Indonesia. However, English is used in lecture materials (Course books and materials, Presentations, PowerPoint slides) and references in many courses. In addition, there is an English Club that students can participate in to improve their English language skills. In general, the teachers' and students' English proficiency is adequate but could be improved to facilitate more international activities.

Conclusions

In summary, the expert group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concept comprises a variety of teaching and learning forms as well as practical aspects that are adapted to the respective subject culture and study format.

Criterion 2.4 Support and Assistance

Evidence:

- Self-Assessment Report
- UNILA Academic Regulations 2020
- Discussions during the audit

Preliminary assessment and analysis of the experts:

UNILA offers a comprehensive advisory system for all undergraduate students. At the start of the first semester, every student is assigned to an academic advisor. Each academic advisor is a member of the academic staff and is responsible for approximately 20 students

from their classes. The academic advisor is the student's first contact point for advice or support on academic or personal matters.

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

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

The fourth-year students who prepare their final thesis/project are usually supervised by three lecturers, with one or two lecturers as supervisors and the others as examiners. The thesis supervisor is responsible for providing advice and guidance to students in determining research topics, writing proposals, supervising the implementation of research, writing reports, and assisting students in presenting their research results.

All students at UNILA have access to the digital academic information system (Sistem Informasi Akademik, SIAKADU). The students' profiles (student history, study plan, academic transcript and grade point average/GPA, lecturer evaluation, and course list) are available via SIAKADU. In addition, course materials and supporting documents compiled by the lecturers are provided in SIAKADU.

To help students find suitable jobs after graduation, UNILA has established the Center for Career and Entrepreneurship Development (CCED), which announces job vacancies and opportunities to students, offers career guidance and coaching, provides psychological support, and conducts alumni surveys.

Finally, there are 131 student organisations at UNILA (as of 2021). They include student activity clubs, which are divided into arts, sports, religious, and other non-curricular activities, and other organisations at the university level. At the Faculty of Mathematics and Natural Science, there are 10 student organisations, including a Student Executive Board.

Conclusions

The experts acknowledge the positive and trustful relationship between the students, the alumni, and the teaching staff; there are enough resources available to provide individual assistance, advice, and support for all students. The experts also note the strong support culture between the students. This 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 and seem satisfied with the program and support system.

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

2.1

UNILA demonstrates a commitment to enhancing Student Mobility. It is actively working to create additional scholarships tailored for student mobility, promoting these opportunities on its website. While the experts acknowledge these initiatives, they highlight feedback from students who suggest that supporting them in language test preparation for scholarship qualification would be beneficial. Additionally, the experts recommend providing detailed information through emails or information meetings to further inform students about the available opportunities.

The experts consider criterion 2 to be fulfilled.

3. Exams: System, concept, and organisation

Evidence:

- Self-Assessment Report
- Module Handbook
- Thesis samples
- Exam Samples
- UNILA Academic Regulations 2020

Preliminary assessment and analysis of the experts:
According to the Self-Assessment Report, the students' academic performance is evaluated based on written exams (e.g., multiple choice, essays, quizzes, and calculations), oral exams, presentations, practical work, papers, and reports.

The teaching team can perform assessment techniques in the form of observation, participation, performance, written tests, and oral tests. The result of the assessment is obtained from the integration of the various assessment techniques and instruments used.

The assessment of students' learning outcomes is processed using criterion-referenced scoring or CRS.

Assessment of learning processes and outcomes can be done in the form of structured assignments, quizzes, pre and post-tests at the beginning and at the end of lab classes, in-class observations, lab exams, mid-semester exams, and end-of-semester exams. In the practical work, students are required to make a report on the observations that are evaluated by a practicum assistant. Students are required to attend at least 80 % of the lectures and have to participate in all practical activities.

The form of each exam is mentioned in the module descriptions that are available to the students via UNILA's homepage and the digital platform SIAKADU. Usually, there are two written exams in each course (besides the assignments, homework, and presentations); the mid-term exam is conducted in the 8th week of the semester, and the final exam in the 16th week.

Supplementary examinations or substitutes are permitted for students who have valid reasons (such as illness as evidenced by a doctor's letter or for students with disabilities or other limitations with compensation agreed upon individually) after obtaining approval from the respective teacher.

All stages of the learning assessment results are announced to students to be checked for correctness. If there is an error by the lecturer in giving grades, students can apply for correction of grades to the teacher by bringing evidence in the form of exam files and structured assignments. Students can access their grades at any time through SIAKADU.

Students in the final year are required to complete a final thesis/project by conducting research in relation to their field of interest. Each student will be guided by one or two supervisors who are determined by the Head of the Study Programme according to their expertise. The purpose of this final project is to synthesise knowledge, apply scientific methods in problem-solving, obtain research objectives, and deepen understanding of the research area of interest. The thesis includes writing a research proposal, preparing the written thesis, and presenting the results in the Research Result course. Research Proposal and Research Result are assessed based on three aspects of skills, namely quality of written material, presentation performance (language and style), and mastery of concepts.

The experts reviewed some sample theses provided by the institution. They found that these theses met the standards expected at the bachelor level and maintained a good level of quality. This confirms UNILA's commitment to maintaining high academic standards in its programs.

If a student fails a course in a certain semester, the student can retake the course at the next opportunity. Students are given the opportunity to retake failed courses twice. If students still fail, they will be facilitated with a remedial course called Studi Terbimbing. This means that students attend an additional coaching course in order to prepare them for passing the final exam.

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

UNILA does not comment on criterion 3.

The experts consider criterion 3 to be fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Staff Handbook
- Masterplan of Research and Community Service
- Study plans
- Module handbook

Preliminary assessment and analysis of the experts:

At UNILA, staff members hold different academic positions (see table below). There is one professor, associate professors, assistant professors, and lecturers. The academic position of each staff member is based on research activities, publications, academic teaching, supervision of students, and other supporting activities. For example, a full professor must hold a doctoral degree and should have a track record of research publications. In addition, the responsibilities and duties of a staff member in terms of teaching, research, and supervision depend on the academic position. The main difference in duties and responsibilities based on the academic staff position lies in the proportion of teaching and research activities. Overall, faculty members report that, mainly due to staff shortages, their workloads are heavy on the teaching side, and with their administrative duties, this leaves little time for research activities.

According to the Self-Assessment Report, the Department of Computer Science currently employs 26 teaching staff members to cater to 689 students, although the Staff Handbook

indicates 28 faculty members. While this meets the Ministry of Education's specified ratio requirements, it is worth noting that the ratio significantly shifts when considering the lecturers' highest qualifications. The program coordinators recognize the need for an effort to increase the number of lecturers to further enhance the department's capacity.

The percentage of lecturers with a master's degree qualification is 77.78%, while 22.22% have a doctoral qualification. 5-7 lecturers are currently doing their doctoral studies in other universities. The goal is to double the number of faculty in the program to around 50-60 in the coming years.

The experts note that there is only one full professor in the academic staff pool and this number needs to be increased. The programme coordinators state that inviting visiting professors is very difficult at the moment, as the development path towards professorship is very long in Indonesia. However, efforts are being made to collaborate more with other universities to have visiting professors and develop teaching methods and research topics.

It is noted by the experts and recognized by the programme coordinators that the level of qualifications of academic staff, in general, needs to be increased by looking into hiring more external professors, improving career development opportunities, and providing study and research scholarships, scholarship seminars, and international collaboration opportunities. Facilitation of professional development, however, should be implemented without overburdening existing personnel.

Based on the information provided in the Self-Assessment Report, the academic ranks for each staff member are as follows:

Professor	1
Associate Professor	2
Assistant Professor	12
Lecturer	13
Total	28

The academic staff is involved in a number of research projects funded by grants from the Indonesian government, the university itself, or other research funds, which usually results in publications. If the respective grants allow it, students are involved in these projects, mostly through undergraduate theses.

Details of the academic qualifications of the teachers are described in the staff handbook. All full-time members of the teaching staff are obliged to be involved in (1) teaching/advising, (2) research, and (3) community service. However, the workload can be distributed differently between the three areas from teacher to teacher. In addition, there are non-academic staff members consisting of librarians, technicians, and administrative staff.

Research

During the audit, the experts inquired how high the teaching load is and if enough opportunities are offered to the academic staff members to conduct research activities. They learn that teachers for the Computer Science program have a standard teaching workload of 12 hours per week. 4-8 hours are allocated to research and working with students. One credit is equivalent to 170 minutes of work per week with about one hour of contact time. How much time staff members actually devote to research is different from teacher to teacher, because working hours are spent flexibly on teaching, research, and community service. This also means that the time for research activities will often be limited due to other (teaching) obligations, which, in turn, affects the time available for career development and advancing toward a doctoral degree or professorship. The experts note that the faculty members are very motivated in their teaching, their research activities, and their career development. However, in general, there is little time available for research or career development activities.

Conclusions

In summary, the experts confirm that the composition, scientific orientation, and qualification of the teaching staff – besides the already mentioned points – are suitable for successfully implementing and sustaining the degree programme.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Staff Handbook
- Masterplan of Research and Community Service
- Discussions during the audit

Preliminary assessment and analysis of the experts:

UNILA encourages training of its academic and technical staff to improve their educational abilities and teaching methods. As described in the Self-Assessment Report, faculty members attend courses in English language training, Information and Communications

Technology, laboratory safety and instrumentation, writing publications, and e-learning. The university has also made efforts to provide further study scholarships for lecturers, hold scholarship seminars, and engage in international collaborations.

Furthermore, PEKERTI (Instructional Technique Workshop) and Applied Approach (AA) provide a compulsory, university-level training called *Instructional Engineering Basic Skills Improvement Training.* It is for all staff members and focuses on advancing pedagogical knowledge. It is designed particularly for junior faculty members to introduce various teaching methods, learning strategies, preparation of assessments, and class management, as well as syllabus and course content development. All teachers at UNILA are obligated to attend the lecturer certification programme held by the Directorate General of Higher Education (Direktorat Jenderal Pendidikan Tinggi Ditjen, DIKTI). An official teaching certificate is issued after the faculty member has completed the certification process. Most Department of Computer Science lecturers already have an educator certificate (82%, or 18 lecturers). In addition, the study programme organises training to upgrade lecturers' pedagogical content knowledge on a regular basis.

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

Teacher performance at the Faculty of Mathematics and Natural Sciences (FMIPA) is evaluated annually through BKD (Lecturer Workload), SKP (Staff Performance Index), and MySAPk (Personnel Service Application System). The performance of lecturers and staff is also evaluated based on the results of students' questionnaires at the end of each semester.

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

The experts also 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 UNILA, their opportunities to further improve their didactic abilities, and to spend some time abroad to attend conferences, workshops or seminars.

As indicated in Criterion 1.3, the experts encourage UNILA to offer more courses taught entirely in English and with a more international focus, in order to give students and staff the opportunity to develop a more international understanding of their subjects, increase their international opportunities, and to improve their language skills.

Conclusions

In summary, the auditors confirm that UNILA offers sufficient support mechanisms and opportunities for members of the teaching staff who wish to further develop their academic, professional, and teaching skills. As a point of caution, the experts recommend that professional development outside UNILA should be facilitated without overloading other faculty members in their absence.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Report
- Videos of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Basic funding for the undergraduate programme and the facilities are provided by UNILA and the Faculty of Mathematics and Natural Sciences (FMIPA). The financial sources are government funding, tuition fees from students, community, and industry funding. Additional funds for research activities can be provided by UNILA or the Indonesian government (Bantuan Pendanaan Perguruan Tinggi Nasional, BPPTN), but the teachers have to apply for them.

The implementation of the Computer Science programme is supported by facilities that include offices, lecture halls, and (computer) laboratories. Other public facilities such as Health services, sports, and conference halls are available and managed by the University.

There are ten laboratories in FMIPA, namely Basic Physics Laboratory, Electronics Laboratory, Core and Experimental Physics Laboratory, Basic Chemistry Laboratory, Software Engineering Laboratory, Computing Laboratory, Biology Laboratory, Biochemistry Laboratory, Instrumentation Laboratory, as well as an Applied Mathematics and Statistics Laboratory.

Out of these ten, the Computer Science programme utilises two labs for study, the Software Engineering Laboratory (RPL) and the Computing Laboratory. The RPL lab has one room, while the Computing Laboratory has three rooms available. Each room has a capacity of 30

people and is equipped with 30 PCs or Laptops that feature Intel i7 processors. All computers in both labs are installed with software related to computer science.

Laboratory equipment is regularly monitored, inspected, and calibrated by qualified technicians. UNILA provides funding that can be applied for to replace, repair, or upgrade equipment or facilities.

The provided budget allows the departments to conduct the study programme as well as some specific activities, including student exchange programmes, student financial assistance for research, and participation in international conferences. The academic staff members emphasise that from their point of view, the Computer Science programme receives sufficient funding for teaching and learning activities and equipment replacements and updates/upgrades. They mention recent investments in computers for the study rooms and a high-performance computer.

The expert group sees that modern research equipment for advanced laboratory work is available in the Integrated Laboratory UPT, which is used by staff members from all faculties. In the Integrated Laboratory, some advanced instruments such as high-performance computers are available, and it is possible for teachers and senior students to use the technical equipment upon appointment. UPT is also used by companies from the area and UNILA cooperates with them in conducting applied research projects. In addition, the FMIPA cooperates with companies and research institutions, where students can conduct the internship and the final project. Due to these collaborations, students can use the technical equipment in these institutions, which is sometimes more sophisticated than at UNILA.

The students also expressed their satisfaction with the library and the available resources there. Remote access via VPN is possible (there is Digital Library UNILA for this purpose) and UNILA offers access to several scientific digital databases such as ScienceDirect and Scopus, so that teachers and students have sufficient access to current scientific papers, e-books, and journals.

Conclusions

In preparation for the audit, the university provided a series of videos showing the laboratories of the programmes. During the online visit, the laboratories, study rooms, lecture halls, and the library were shown in more detail. The experts noted that the facilities are in very good condition and appear to be fully modernised. Students and faculty are satisfied with their functionality. The central library, the departmental libraries, and the faculty reading rooms are generally well-equipped, and there is adequate room for self-study and group-study activities.

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

4.1 & 4.2

UNILA has successfully recruited 15 new faculty members for the upcoming odd semester in 2024. Additionally, it is actively pursuing collaborations with other universities to enhance the qualifications of existing staff members. The experts express satisfaction with these initiatives and are optimistic that these efforts will alleviate the workload for the existing staff, thereby improving the overall situation.

The experts consider criterion 4 to be fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module Handbook
- Homepage Ba Computer Science
- Homepage UNILA
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The module handbook provided contains information about the people responsible for each module, the teaching methods and workload, the credit points awarded, the intended learning outcomes, the examination requirements, the forms of assessment, the applicability, the admission requirements, and details explaining how the final grade is calculated. Detailed programme information including expected Learning Outcomes (LO), structure and curriculum, learning and assessment methods as well as academic staff profiles can be accessed through the department website as well as the faculty website.

After review of the module descriptions of the Computer Science programme, the experts note that some necessary information is missing. The module handbook should be updated to include the dates of the last amendment for each module, as well as the awarded ECTS per module.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Samples Diploma
- Samples Diploma Supplement

Preliminary assessment and analysis of the experts:
The experts confirm that students of the Computer Science programme are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The experts point out that the Diploma Supplement should be aligned with the European template. Using a standardised form facilitates academic and professional recognition, thus increasing the transparency of qualifications.

The Transcript of Records lists all the courses that the graduate has completed, the achieved 'marks', and a list of learning outcomes. The experts point out that the Diploma Supplement should include information on the relative grade ('marks') or statistical information about the distribution of the final grade in order to assess the individual performance in comparison to other graduates. Moreover, information about the awarded credits, ECTS, and cumulative GPA should be mentioned in the document.

Criterion 5.3 Relevant rules

Evidence:

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

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

In addition, most of the relevant information about the degree programme (e.g. study plan, profile) is available on the English homepage of the programme.

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

5.1 & 5.2

UNILA acknowledges the feedback provided by the experts and is committed to enhancing the module descriptions and the Diploma Supplement in response to the criticisms raised.

The experts commend UNILA's dedication to improvement and anticipate the revised documents to reassess the fulfillment of this criterion.

Currently, the experts deem this criterion as not fulfilled.

6. Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- UNILA Academic Regulations 2020
- Tracer Study 2020
- Course Audit Sample (Logika)
- Customer Satisfaction Surveys 2020 and 2021
- Internal Quality Audit Results 2021
- Discussions during the audit

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

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 UNILA. SPME focuses on both national and international accreditations. Every degree programme and every Higher Education Institution in Indonesia has to be accredited by the National Accreditation Board of Higher Education / Badan Akreditasi Nasional Perguruan Tinggi (BAN-PT). The Bachelor's degree programme Computer Science has received the highest accreditation status (A) from BAN-PT.

At the university level, the implementation of internal quality assurance is coordinated by the Institute for Learning Development and Quality Assurance (LP3M), which, according to its website, has several centers related to internal quality assurance, namely:

1. Center for Teacher Professional Education Center (P3G);
2. Center for the Management of Learning and Field Practice (P4L);
3. Center for Curriculum and Learning Resources (P2KSB);

4. Center for Learning Development and Instructional Activities (P3AI) which is related to monitoring and evaluating the use of learning strategies
5. Center for Character Development and Guidance and Counseling Services (P2KLBK);
6. Quality Assurance Center (PPM), which is related to the implementation of internal audits.

At the faculty level, the implementation of internal quality assurance is coordinated by the Quality Assurance Board of the Faculty (TPMF), while at programme level it is carried out by the Quality Assurance Board of the study programme (TPMP). At the end of each semester, a final lecture Report is produced. Including the results of LP3M audits at programme level, student surveys, and discussion rounds.

Internal assessment of the degree programme's quality is mainly provided through students, alumni, and employer surveys. The students give their feedback on the courses by filling out the online questionnaire at the end of each semester. Students assess 16 aspects such as students' understanding, lecturer's responsiveness, course delivery, lecturer's proficiency, explanation of course objective, and references in each enrolled course.

Giving feedback on the classes is compulsory for the students; otherwise, they cannot access their account on the digital platform SIAKADU. A summary of the results is made accessible to the students.

In addition, UNILA regularly conducts alumni tracer studies. By taking part in this survey, alumni can comment on their educational experiences at UNILA, the waiting period for employment after graduation, their professional career, and they can give suggestions on how to improve the programme. Furthermore, there is the Center for Career and Entrepreneurship Development Centre at UNILA, which offers help to find suitable internships, announces job vacancies, and offers courses to develop soft skills. FMIPA organises a job fair every year, and in addition, the contacts students make during the internship and the final project (which can be conducted outside UNILA) sometimes lead to job offers.

The experts discuss during the audit if there are regular meetings with the partners at the faculty or department level, where they discuss the needs and requirements of the employers and possible changes to the degree programme. They learn that the involvement of industry partners in improving and updating the curriculum seems to be minimal. Alumni are more involved in feedback activities; they are invited to give their feedback on the content of the degree programme and participate in the tracer studies. The experts appreciate that UNILA stays in contact with its alumni, but it is important to establish a closer relationship with industry partners.

Conclusions

In summary, the expert group confirms that the quality management system is suitable for identifying weaknesses and improving the degree programme. The feedback from the students is followed up on by the lecturers and alumni are involved by providing feedback in the tracer studies. As important stakeholders, industry representatives should be more explicitly involved in the quality assurance process to improve and update the curriculum.

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

UNILA affirms its dedication to incorporating the labor market perspective in forthcoming processes for curriculum planning and evaluation.

While the experts acknowledge these future plans and anticipate their implementation, as of the current assessment, Criterion 6 is deemed not fulfilled.

D Additional Documents

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

- none

E Comment of the Higher Education Institution (08.11.2023)

The university has submitted the following statement:

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

In response to the recommendations provided by expert reviewers, BA Computer Science at Universitas Lampung acknowledges the valuable input and insights provided by ASIIN experts. We consider these recommendations as a significant step in our continuous improvement process.

As part of our commitment to quality education and alignment with international standards, Study Programme of Computer Science would like to highlight the following key points:

1. Embracing the Evaluation Cycle: At Universitas Lampung, our curriculum and vision/mission undergo evaluation every four years. This periodic evaluation process ensures that our educational programs remain up-to-date and relevant. Regarding the proposed shift in program focus towards "making a meaningful impact on society," we are determined to revisit our program's vision in the year 2024. This will allow us to incorporate the feedback and recommendations of ASIIN experts into our future vision.

   Building upon the feedback from ASIIN experts and our commitment to continuous improvement, the BA Computer Science program at Universitas Lampung is dedicated to aligning our vision with local and global needs while emphasizing the importance of making a meaningful impact on society. In this context, we would like to highlight the following vision for the Computer Science program not only equipping students with strong foundational knowledge in computer science but also preparing them to address the specific needs of our local and global community. We aim to bridge the gap between technology and societal challenges by emphasizing practical applications in various domains, including agriculture, biology, medicine, and the development of smart societies.

2. Stakeholder Involvement: To achieve our vision of creating meaningful impact on society, we are committed to actively engaging with our stakeholders. During the curriculum evaluation process, we plan to involve a wide range of stakeholders, including industrial partners such as PT Bakrie Sumatera Plantations Tbk (an agriculture company), PT. Bank Lampung, PT. Sevima (EdTech Company), xDemia.com, Dicoding.com, local government representatives, representatives from healthcare institutions, and industry partners who serve as both end-users of our graduates and hosts for student internships. This inclusive approach ensures that our program remains closely aligned with the evolving needs and expectations of these vital stakeholders. It also aligns with our commitment to producing graduates who can positively influence and contribute to society.

Criterion 1.3 Curriculum

Reordering of Software Engineering Courses: in response to the recommendation concerning the arrangement of Software Engineering courses within the curriculum, the program will implement this adjustment during the forthcoming curriculum revision, scheduled to be effective from the upcoming semester in 2024.

Enhancing English Language and Soft Skills:

- The Study Programme has already taken several steps to enhance students' English language proficiency and soft skills development. An English Club has been established to provide students with opportunities to improve their conversational, writing, and reading skills.
- To further elevate students' English language skills, the study programme will actively encourage students to participate in events and activities related to English language proficiency. As an illustrative example, in 2023, a Computer Science student achieved national recognition by winning the Scrabble competition in Jakarta. This highlights the study programm's commitment to fostering English language skills among students.

- The study programme is actively encouraging students to use English for the presentation of their projects, theses, and the writing of journal articles. It's noteworthy that the academic regulations of Universitas Lampung require students

to achieve a minimum score of 450 in the English Proficiency Test (EPT), which is equivalent to a 450 TOEFL score.

- Recognizing the importance of soft skills, particularly presentation skills, the study programme mandates that students engaged in project-based learning must conduct presentations to demonstrate their project outcomes. Additionally, students are encouraged to participate in both internal and external student organizations to further develop their soft skills.
- To enhance both soft and hard skills, the curriculum includes a Special Assignment course in which students serve as teaching assistants during practical sessions. This hands-on experience further equips students with valuable skills and knowledge.

Criterion 1.4 Admission requirements

In response to the experts' recommendation to establish a specialized admissions system for foreign students, we are pleased to inform that Universitas Lampung has already taken proactive steps in this direction. We have implemented a dedicated system for foreign student admissions, accessible through the following website: http://io.unila.ac.id/admission-2023/.

This specialized admissions system is designed to streamline the application process for international students, making it more convenient and accessible. It provides a centralized platform where prospective foreign students can easily submit their applications, upload required documents, and receive updates on the status of their applications.

Furthermore, our institution has also initiated efforts to provide comprehensive support services to international students, including assistance with visa applications, orientation programs, and access to academic and non-academic resources. These services are aimed at ensuring a smooth transition for foreign students into our academic community and helping them thrive during their studies at Universitas Lampung.

Criterion 2.1 Structure and Modules: International Mobility

In response to the recommendations made by the experts and with a strong commitment to enhancing international mobility, Universitas Lampung (UNILA) is taking the following concrete steps to ensure a more robust international mobility framework:

Scholarships for Student Mobility: UNILA is dedicated to increase student participation in international mobility programs. To facilitate this, we are in the process of establishing scholarships specifically designed to support students who wish to engage in international mobility experiences. These scholarships will alleviate financial constraints and make it more accessible for students to take part in international exchanges. Furthermore, each year, faculties will allocate funds to support this initiative, demonstrating our commitment to our international partners. As an example, in 2023, two Computer Science students were funded to participate in a Student Mobility program at Universiti Malaya in Malaysia. Additionally, credits earned during international mobility activities will be recognized as part of the course requirements for our students. This will not only enhance their international experiences but also contribute to their academic progress.

Information Dissemination: To ensure that students are well-informed about the opportunities available for international mobility, UNILA is actively disseminating information regarding student mobility programs through our university website. This information will include details on application procedures, deadlines, available programs, and scholarship opportunities. Our aim is to provide students with clear and accessible resources to empower them to make informed choices regarding international mobility.

Enhanced International Cooperation: We are committed to expanding our international network by establishing collaborations and exchange agreements with universities and institutions worldwide. These partnerships will create a broader spectrum of international mobility opportunities for our students, allowing them to gain invaluable international exposure.

Supporting Visiting Lecturers: UNILA is actively inviting visiting lecturers from international backgrounds to enhance the global perspectives within our academic community. These guest lecturers will contribute to the diversification of academic experiences and enrich the education our students receive.

Criterion 4.1 - Staff and 4.2 - Staff Development

University is dedicated to enhancing the qualifications and staff pool. In 2023, we have taken significant steps to achieve this goal, including the following:

New Faculty Recruitment: In an effort to reduce the workload on teaching staff and provide opportunities for professional development, Universitas Lampung has opened new faculty positions. We are pleased to announce that 15 new faculty members will join our institution, effectively commencing their roles in the upcoming odd semester of 2024. This initiative will strengthen our academic workforce and contribute to a more balanced workload for our teaching staff.

Collaborations for Academic Support: UNILA recognizes the need for academic support in programs with limited full professors. In the case of the Computer Science program, we currently collaborate with professors from the Mathematics Department to assist in student research activities. This collaboration enhances the quality of education and research for our students. In addition, in 2023, UNILA is exploring a collaboration with the Computer Science program at Universitas Gadjah Mada. This collaboration is expected to result in future joint activities, including visiting professors, joint student supervision, and collaborative research efforts.

Criterion 5.1 Module description

UNILA acknowledges the observations made by the experts regarding the module descriptions in the Computer Science program. We understand the importance of providing comprehensive and up-to-date information to ensure transparency and clarity for our students.

To address these concerns and improve the module descriptions, we will implement the following measures:

- **Updating Module Handbook:** The module handbook will be thoroughly reviewed and updated to include essential information for each module. This will include specifying the dates of the last amendment for each module. This ensures that students and stakeholders have access to accurate and current information regarding the content and structure of each module.
- **Inclusion of Awarded ECTS:** In addition to updating the last amendment dates, the module handbook will also clearly indicate the awarded European Credit Transfer

and Accumulation System (ECTS) credits for each module. This information is crucial for students to understand the credit value of each module, facilitating their academic planning and progress tracking.

5.2 Diploma and Diploma Supplement

Regarding the alignment of the Diploma Certificate and Transcript of Records with the European template, Universitas Lampung is currently in the process of planning to include ECTS (European Credit Transfer and Accumulation System) information on students' transcripts. This decision is based on a response received for the Biology, Physics, and Mathematics study programs, which requested the inclusion of ECTS information on transcripts. Please find below a draft of the academic transcript (https://tinyurl.com/5drzuuw6) that will include ECTS information for future reference. You can also access the draft of the Diploma Supplement through the following link (https://tinyurl.com/4ebvs639).

Criterion 6 - Quality Management: Quality Assessment and Development (Continuation)

In response to the findings and recommendations made by the ASIIN experts, the Computer Science program at UNILA is dedicated to enhancing its quality management system with a particular focus on industry collaboration and curriculum development. The following steps will be taken to ensure the continuous improvement of our program:

Our program has been certified ISO 9001:2015 KAN. This is to ensure that the academic process in our program is according to international standards.

Our program has also been accredited by the National Accreditation Organization for Higher Education (BAN-PT). We achieved an ‘A’ score from 2016 until 2026.

Enhanced Industry Collaboration:

The Computer Science program recognizes the essential role that industry partners play in the development and implementation of our curriculum. To further strengthen our collaboration with industry stakeholders and ensure the quality and relevance of our curriculum, the following measures will be implemented:

1. **Curriculum Planning and Evaluation:** UNILA is committed to involving industry partners in the planning and evaluation of our curriculum. This collaboration will ensure that our program aligns with the evolving needs and requirements of the job market.

2. **Determining Course Content:** Industry partners will actively participate in determining the content of individual courses. **This** will enable us to integrate real-world industry insights, practical knowledge, and emerging trends into our curriculum.

3. **Competency Assessment:** UNILA **will** work closely with industry representatives to establish competency assessments for students engaged in internships and research activities in the industry. This collaboration will help us in setting clear standards for student performance and ensuring that they acquire the necessary skills and knowledge during their industrial engagements.

The goal of these initiatives is to establish a dynamic and mutually beneficial relationship between the academic program and the industry. This will enable us to continuously improve our curriculum to meet the demands of the job market, while providing students with a well-rounded education that aligns with industry needs.

F Summary: Expert recommendations (15.11.2023)

Taking into account the additional information and the comments given by UNILA, the experts 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 Computer Science	With requirements for one year	/	30.09.2029

Requirements

A 1. (ASIIN 1.3 & ASIIN 6) Ensure that the labor market perspective is considered in the development of the curriculum.

A 2. (ASIIN 5.1) The module descriptions need to include information about the the awarded ECTS points.

A 3. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Recommendations

E 1. (ASIIN 1.1) It is recommended to revise the Vision in order to be more realistic.

E 2. (ASIIN 1.3) It is recommended to move the course "Software Engineering" into a later stage of the curriculum.

E 3. (ASIIN 1.3) It is recommended to strengthen the soft skills of the students, especially their communication and presentation skills, as well as their business and negotiation skills.

E 4. (ASIIN 2.2) It is recommended to merge courses into bigger modules in order reduce the exam load.

E 5. (ASIIN 1.3 & 4.2) It is recommended that more opportunities be provided to improve the English communication skills of faculty and students (e.g., offering courses in English).

E 6. (ASIIN 2.1) It is recommended to provide enhanced opportunities and support for students to study abroad, including scholarships, IELTS test preparation, and improved information dissemination on available options.

E 7. (ASIIN 4.1, 4.2) It is recommended to increase the number of full professors and staff to facilitate professional development without overburdening existing personnel during their absence.

E 8. (ASIIN 4.1) It is recommended to consider hiring professors externally.

G Comment of the Technical Committee (28.11.2023)

Assessment and analysis for the award of the ASIIN seal:

Mr. Esch reports on the procedure. The TC discusses the procedure and in particular requirement A1. The TC would like to know how the requirement came about, as it seems quite specific. Mr Esch explains that this condition is primarily based on a suggestion from the discussion round with the industry representatives, as they would like to be involved to a greater extent. However, Mr Esch also explained that this was not a serious problem, as no other side had complained about it and the main aim was to meet the needs of the industry. Although the TC can understand this, it does not see this as a sufficient deficiency to justify a requirement. The TC is therefore in favour of deleting this requirement and converting it into a recommendation.

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 Computer Science	With requirements for one year		30.09.2029

Requirements

A 1. (ASIIN 5.1) The module descriptions need to include information about the awarded ECTS points.

A 2. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic

level of the degree programme as well as about the individual performance of the student. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Recommendations

E 1. (ASIIN 1.1) It is recommended to revise the Vision in order to be more realistic.

E 2. (ASIIN 1.3) It is recommended to move the course "Software Engineering" into a later stage of the curriculum.

E 3. (ASIIN 1.3) It is recommended to strengthen the soft skills of the students, especially their communication and presentation skills, as well as their business and negotiation skills.

E 4. (ASIIN 1.3 & ASIIN 6) It is recommended to consider the labor market perspective in the development of the curriculum.

E 5. (ASIIN 2.2) It is recommended to merge courses into bigger modules in order reduce the exam load.

E 6. (ASIIN 1.3 & 4.2) It is recommended that more opportunities be provided to improve the English communication skills of faculty and students (e.g., offering courses in English).

E 7. (ASIIN 2.1) It is recommended to provide enhanced opportunities and support for students to study abroad, including scholarships, IELTS test preparation, and improved information dissemination on available options.

E 8. (ASIIN 4.1, 4.2) It is recommended to increase the number of full professors and staff to facilitate professional development without overburdening existing personnel during their absence.

E 9. (ASIIN 4.1) It is recommended to consider hiring professors externally.

H Decision of the Accreditation Commission (08.12.2023)

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

The Accreditation Commission discusses the procedure. It agrees with the adjustments made by the technical committee and follow the overall assessment of the experts.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Computer Science	With requirements for one year	/	30.09.2029

Requirements

A 1. (ASIIN 5.1) The module descriptions need to include information about the awarded ECTS points.

A 2. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Recommendations

E 1. (ASIIN 1.1) It is recommended to revise the Vision in order to be more realistic.

E 2. (ASIIN 1.3) It is recommended to move the course "Software Engineering" into a later stage of the curriculum.

E 3. (ASIIN 1.3) It is recommended to strengthen the soft skills of the students, especially their communication and presentation skills, as well as their business and negotiation skills.

E 4. (ASIIN 1.3 & ASIIN 6) It is recommended to consider the labor market perspective in the development of the curriculum.

E 5. (ASIIN 2.2) It is recommended to merge courses into bigger modules in order reduce the exam load.

E 6. (ASIIN 1.3 & 4.2) It is recommended that more opportunities be provided to improve the English communication skills of faculty and students (e.g., offering courses in English).

E 7. (ASIIN 2.1) It is recommended to provide enhanced opportunities and support for students to study abroad, including scholarships, IELTS test preparation, and improved information dissemination on available options.

E 8. (ASIIN 4.1, 4.2) It is recommended to increase the number of full professors and staff to facilitate professional development without overburdening existing personnel during their absence.

E 9. (ASIIN 4.1) It is recommended to consider hiring professors externally.

I Fulfilment of Requirements (24.09.2024)

Analysis of the experts and the Technical Committee (05.09.2024)

A 1. (ASIIN 5.1) The module descriptions need to include information about the awarded ECTS points.

Initial Treatment	
Experts	Fulfilled. Justification: The university has submitted revised module descriptions, which now contain information on the ECTS points awarded. The requirement can therefore be considered fulfilled.
TC 04	Fulfilled. Vote: unanimous Justification: The TC follows the assessment of the experts.
AC	Fulfilled. Vote: unanimous Justification: The AC follows the assessment of the experts.

A 2. (ASIIN 5.2) Issue a Diploma Supplement that contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Initial Treatment	
Experts	Fulfilled. Justification: The university has submitted Diploma Supplements that provide all the required information. The requirement can therefore be regarded as fulfilled.
TC 04	Fulfilled. Vote: unanimous Justification: The TC follows the assessment of the experts.
AC	Fulfilled. Vote: unanimous Justification: The AC follows the assessment of the experts.

Decision of the Accreditation Commission (24.09.2024)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Computer Science	All requirements fulfilled	-/-	30.09.2029

Appendix: Programme Learning Outcomes and Curricula

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

Source: Curriculum Book (2020)

Four areas of Programme Learning Outcomes (PLO): Attitude, General, Knowledge, and Special Skills.

General Skills PLO based on Ministry of Education and Culture Regulation No.3 of 2020.

GENERAL SKILLS PLO	
CODE	**DESCRIPTION**
1	Able to apply logical, critical, systematic, and innovative thinking in the context of the development or implementation of science and technology that takes into account and applies appropriate humanities values in line with their field of expertise;
2	Able to demonstrate independent, high-quality, and measurable performance;
3	Able to analyze the implications of the development or implementation of science and technology that takes into account and applies appropriate humanities values in line with their field of expertise based on scientific rules, procedures, and ethics in order to produce solutions, ideas, designs, or critiques of art;
4	Able to compose a scientific description of the results of the above-mentioned study in the form of a thesis or final report, and upload it on the university website;
5	Able to make accurate decisions in the context of problem-solving in their field of expertise, based on the analysis of information and data;
6	Able to maintain and develop working relationships with supervisors, colleagues, and peers within and outside of their organization;

GENERAL SKILLS PLO	
CODE	**DESCRIPTION**
7	Able to be responsible for the achievement of group work results and supervise and evaluate the completion of tasks assigned to workers under their responsibility;
8	Able to conduct self-evaluation of the work group under their responsibility, and able to manage learning independently; and
9	Able to document, store, secure, and retrieve data to ensure accuracy and prevent plagiarism.

Learning Outcomes for Graduates based on National Higher Education Qualification Framework (SN Dikti)

Code	PLO	Aspect
PLO-01	Have religious attitudes and tolerance to differences, as well as responsible and contribute to law enforcement, ethics, and norms for social life and environmental preservation.	Attitude
PLO-02	Able to apply logical, critical, systematic, and innovative thinking and apply humanities in accordance with the field of computer science;	General
PLO-03	Able to examine the implications of developing or implementing technological science based on rules, procedures and scientific ethics to produce solutions, ideas, and designs related to computer science.	General
PLO-04	Competent in making accurate decisions in the context of problem solving based on the results of information and data analysis	General
PLO-05	Able to apply entrepreneurship and skilled at communicating both orally and in writing as well as in teamwork.	K and S

PLO-06	Having a thorough understanding and ability to use mathematical and statistical concepts, models, and principles to solve various problems.	K and S
PLO-07	Having a complete understanding and ability to use the basic concepts and principles of algorithms and computer programming in computer and intelligent systems.	K and S
PLO-08	Having a complete understanding and ability to apply the concepts and principles of software engineering methods, and an understanding of the concept of software development project management.	K and S
PLO-09	Having a thorough understanding and ability to apply the concepts and principles of analyzing, data modeling, designing, implementing, and evaluating information systems products to meet organizational needs.	K and S
PLO-10	Have in-depth and competent knowledge in applying the basic concepts and application of digital technology and computer organization.	K and S
PLO-11	Having a complete knowledge and competent in applying the	K and S

Code	PLO	Aspect
	basic concepts of operating systems, networks and security of the system and applying it to a distributed system	
PLO-12	Have in-depth knowledge and competence in applying the basic concepts and principles of computer science in the fields of engineering, life sciences or social humanities	K and S
PLO-13	Having a thorough understanding and capable of applying the concepts of strategy, model, and business innovation to the enterprise system.	K and S

Note: K = Knowledge, S = Skills

Code	Graduate Profile	PLO												
		1	2	3	4	5	6	7	8	9	10	11	12	13
GP-01	Technopreneur	✔			✔	✔								
GP-02	IT/IS Consultant	✔		✔						✔				✔
GP-03	Programming and Software Developer	✔	✔					✔	✔					
GP-04	Data Scientist	✔			✔		✔			✔				
GP-05	Database Administrator	✔			✔			✔				✔		
GP-06	Intelligence System Analyst	✔	✔				✔	✔			✔		✔	

No.	Career Opportunity	Description
1	Technopreneur	A technopreneur is someone who has the ability to develop and manage information technology businesses. They have the ability to identify new business opportunities in the field of information technology and capitalize on them in innovative ways.
2	IT/IS Consultant	An IT/IS consultant is someone who provides advice and solutions to companies or organizations on how to use information technology to improve their efficiency and productivity. They have the ability to analyze a company's information technology needs and develop appropriate solutions.
3	Programming and Software Developer	A programming and software developer is someone who has the ability to design, develop, and code software applications. They have the ability to understand programming languages and use them to create useful and efficient applications.
4	Data Scientist	A data scientist is someone who has the ability to collect, analyze, and interpret large data sets. They have the ability to use statistical and machine learning tools and techniques to find useful patterns and information from data.
5	Database Administrator	A database administrator is someone who is responsible for managing a company's databases. They have the ability to organize and optimize databases to function efficiently, as well as ensure the security and integrity of data.
6	Intelligence System Analyst	An intelligence system analyst is someone who has the ability to analyze artificial intelligence systems and develop solutions to improve their performance. They have the ability to understand how artificial intelligence systems work and identify areas that can be enhanced.

The following **curriculum** is presented for the Computer Science programme:

Source: Module Handbook.

NO	COURSE CODE	COURSE TITLE	CREDITS	CHARACTERISTIC
Semester 1				
1	COM620101	LINEAR ALGEBRA	2	Mandatory
2	COM620102	ENGLISH	3	Mandatory
3	COM620103	BASICS PROGRAMMING	3	Mandatory
4	COM620104	LOGIC	3	Mandatory
5	COM620105	MATHEMATICS	3	Mandatory
6	COM620106	STATISTICS AND PROBABILITY	3	Mandatory
7	MIP620101	BASIC SCIENCE	2	Mandatory
8	UNI620101	ISLAMIC EDUCATION	3	Mandatory
9	UNI620102	CATHOLIC EDUCATION	3	Mandatory
10	UNI620103	CHRISTIAN EDUCATION	3	Mandatory
11	UNI620104	HINDU EDUCATION	3	Mandatory
12	UNI620105	BUDDHA EDUCATION	3	Mandatory
13	UNI620109	LOCAL ETHICS AND WISDOM EDUCATION	2	Mandatory
Semester 2				
1	UNI620306	INDONESIAN LANGUAGE EDUCATION	2	Mandatory
2	UNI620307	CIVIC EDUCATION	2	Mandatory
3	COM620107	DISCRETE MATHEMATICS	3	Mandatory
4	COM620108	STRUCTURED PROGRAMMING	3	Mandatory
5	COM620109	INTRODUCTION TO COMPUTER ORGANIZATION	2	Mandatory
6	COM620110	INTRODUCTION TO INFORMATION SYSTEMS	2	Mandatory
7	COM620111	SOFTWARE ENGINEERING	3	Mandatory
8	COM620112	OPERATION SYSTEM	3	Mandatory
9	COM620113	DATA STRUCTURE AND ALGORITHM	3	Mandatory

Semester 3				
1	COM620201	NUMERICAL ANALYSIS	2	Mandatory
2	COM620202	DATABASE	3	Mandatory
3	COM620203	ALGORITHM DESIGN AND ANALYSIS	2	Mandatory
4	COM620204	COMMUNICATION AND PRESENTATION	1	Mandatory
5	COM620205	DATA COMMUNICATION AND COMPUTER NETWORK	3	Mandatory
6	COM620206	OBJECT ORIENTED PROGRAMMING	3	Mandatory
7	COM620207	INTRODUCTION TO DIGITAL SYSTEMS	2	Mandatory
8	COM620208	LANGUAGE AND AUTOMATA THEORY	2	Mandatory
9	COM620209	E-SERVICES	3	Optional
10	COM620210	MULTIMEDIA	3	Optional
11	COM620211	INTERPRETER PROGRAMMING	3	Optional
12	COM620212	SOFTWARE TESTING	2	Optional

Semester 4				
1	COM620213	ANALYSIS AND DESIGN OF INFORMATION SYSTEMS	3	Mandatory
2	COM620214	ARTIFICIAL INTELLIGENCE	3	Mandatory
3	COM620215	FIELD STUDY	1	Mandatory
4	COM620216	MOBILE TECHNOLOGY AND APPLICATIONS	3	Mandatory
5	COM620217	INFORMATION THEORY	2	Mandatory
6	COM620218	INTERNET OF THINGS	3	Optional
7	COM620219	WEB PROGRAMMING	3	Mandatory
8	COM620220	DISTRIBUTED DATA PROCESSING	3	Optional
9	COM620221	DECLARATION PROGRAMMING	3	Optional
10	COM620222	MACHINE LEARNING	3	Mandatory
11	COM620223	KNOWLEDGE MANAGEMENT	2	Optional

Semester 5				
1	COM620301	ENTREPRENEURSHIP	2	Mandatory
2	COM620302	RESEARCH METHODOLOGY	3	Mandatory
3	COM620303	PANCASILA EDUCATION	2	Mandatory
4	COM620304	INTERACTION SYSTEM	3	Mandatory
5	COM620305	EXPERT SYSTEM	3	Mandatory
6	COM620306	ADVANCED WEB PROGRAMMING	3	Mandatory
7	COM620307	CLOUD COMPUTING	3	Optional
8	COM620308	ADVANCED MOBILE PROGRAMMING	3	Optional
9	COM620309	NATURAL LANGUAGE PROCESSING	2	Optional
10	COM620310	PATTERN RECOGNITION	3	Optional
11	COM620311	GEOGRAPHIC INFORMATION SYSTEM	3	Optional

Semester 6				
1	COM620312	PROFESSIONAL ETHICS	2	Mandatory
2	COM620313	INTERNSHIP	3	Mandatory
3	COM620314	DATA WAREHOUSE AND BIG DATA	3	Optional
4	COM620315	GRAPHICS COMPUTER	2	Optional
5	COM620316	INFORMATION SYSTEM SECURITY	2	Optional
6	COM620317	IT PROJECT MANAGEMENT	3	Optional
7	COM620318	OPERATIONS RESEARCH	2	Optional
8	COM620319	INTRODUCTION TO ROBOTICS	3	Optional
9	COM620320	SPECIAL PROJECT	2	Optional
10	COM620321	INFORMATION RETRIEVAL	2	Optional

Semester 7				
1	COM620401	CAPITA SELECTA	2	Mandatory
2	COM620402	SPECIAL TASK	1	Mandatory
3	COM620403	BIOINFORMATION	2	Optional
4	COM620404	BLOCKCHAIN AND CRYPTO CURRENCY	2	Optional
5	COM620405	BUSINESS INTELLIGENCE	2	Optional
6	COM620406	PARALLEL COMPUTING	3	Optional
7	COM620407	COMPUTERS AND SOCIETY	3	Optional
8	COM620408	GAMES DESIGN	3	Optional
9	COM620409	AUGMENTED DAN VIRTUAL REALITY	3	Optional
10	UNI620401	COMMUNITY SERVICE PROGRAM	3	Mandatory

Semester 8				
1	COM620447	RESEARCH PROPOSAL	1	Mandatory
2	COM620448	RESEARCH RESULT	1	Mandatory
3	COM620449	THESIS/FINAL PROJECT	4	Mandatory