AQAS

AGENTUR FÜR
QUALITÄTSSICHERUNG DURCH
AKKREDITIERUNG VON
STUDIENGÄNGEN E.V.

FINAL REPORT

UNIVERSITAS BRAWIJAYA

CLUSTER COMPUTER SCIENCE

INFORMATICS ENGINEERING (BACHELOR OF COMPUTER SCIENCE)

COMPUTER ENGINEERING (BACHELOR OF ENGINEERING)

INFORMATION SYSTEMS (BACHELOR OF COMPUTER SCIENCE)

INFORMATION TECHNOLOGY EDUCATION (BACHELOR OF EDUCATION)

INFORMATION TECHNOLOGY (BACHELOR OF COMPUTER SCIENCE)

COMPUTER SCIENCE (MASTER OF COMPUTER SCIENCE)

December 2022

Content

DECISION OF THE AQAS STANDING COMMISSION

ON THE STUDY PROGRAMMES

- **INFORMATICS ENGINEERING (BACHELOR OF COMPUTER SCIENCE)**
- **COMPUTER ENGINEERING (BACHELOR OF ENGINEERING)**
- **INFORMATION SYSTEMS (BACHELOR OF COMPUTER SCIENCE)**
- **INFORMATION TECHNOLOGY EDUCATION (BACHELOR OF EDUCATION)**
- **INFORMATION TECHNOLOGY (BACHELOR OF COMPUTER SCIENCE)**
- **COMPUTER SCIENCE (MASTER OF COMPUTER SCIENCE)**

OFFERED BY UNIVERSITAS BRAWIJAYA, MALANG, INDONESIA

Based on the report of the expert panel, the comments by the university and the discussions of the AQAS Standing Commission in its 15th meeting on 5 December 2022, the AQAS Standing Commission decides:

1. The study programmes "**Informatics Engineering**" (Bachelor of Computer Science), "**Computer Engineering**" (Bachelor of Engineering), and "**Information Technology Education**" (Bachelor of Education) offered by **Universitas Brawijaya**, **Indonesia** are accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master).

   The study programmes comply with the requirements defined by the criteria and thus the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version.

2. The study programmes "**Information Systems**" (Bachelor of Computer Science), "**Information Technology**" (Bachelor of Computer Science), and "**Computer Science**" (Master of Computer Science) offered by **Universitas Brawijaya**, **Indonesia** are accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master).

   The accreditations are conditional.

   The study programmes essentially comply with the requirements defined by the criteria and thus the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version. The required adjustments can be implemented within a time period of twelve months.

3. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later than **31 December 2023**. The confirmation of the conditions might include a physical site visit within the time period of twelve months.

4. The accreditation is given for the period of **six years** and is valid until **31 December 2028**.

Conditions:

For the study programme “Information Systems” (Bachelor):

1. The university must provide an integrated set of documentation for the course syllabus that describes the contents of the courses including the learning outcomes and methods of assessment. These descriptions must use the same structure and nomenclature, be complete and must not contain any discrepancies.

For the study programme “Information Technology” (Bachelor):

2. The university must demonstrate how the programme trains students at the Bachelor level according to the National Qualifications Framework (KKNI) and the European Qualifications Framework (EQF). The differences to a vocational Diploma programme in Information Technology must be made clear. Changes to the programme and course learning outcomes and/or curriculum might be required to reach a qualification at EQF level 6.

For the study programme “Computer Science” (Master):

3. The structure of the curriculum and the different number of credits for each course and course category must be checked and depicted consistently in all the study programme’s documents.

The following **recommendations** are given for further improvement of the programmes:

For all study programmes:

1. The university should facilitate switching from one to another Bachelor’s programme for the students, based on a simple recognition procedure.
2. The university should foster the academic mobility of students and lecturers and strengthen its internationalisation efforts to attract international students from western countries.
3. In order to support international mobility, the university should summarise the different courses leading to the final thesis into one overarching/meta-module showing the total number of credits allocated to these activities.
4. The course evaluation questionnaire should be less lecturer-centred and more course- and student-centred and address issues such as workload in more detail.
5. The university should find ways to inform students of the results of the evaluation and on the actions taken because of the feedback given by students.
6. The complaints part of the ticketing system of the “Halo Filkom” platform should be anonymised.
7. The faculty should provide a consolidated set of documents for each study programme using identical nomenclature and structure. The course descriptions should include high level information on the assessment.
8. The university should provide additional incentives and support mechanisms, e.g., a teaching load reduction system, to increase the research activities of the teaching staff.

For the study programme “Computer Engineering” (Bachelor):

9. The credits for the compulsory mathematics education should be increased from currently 14 CP (ECTS) to at least 20 CP (ECTS) in order to support international student mobility, including mobility after completing their studies.

For the study programme “Information Systems” (Bachelor):

10. It is recommended that the literature lists in the Curriculum Book be updated.

For the study programme “Information Technology Education” (Bachelor):

11. The intended learning outcomes should explicitly include an attitude aspect linking to professional teacher training.
12. The university should provide full information on the profile of the graduates and the sectors in which they are employed following graduation (schools, education/training, industry).

For the study programme “Computer Science” (Master):

13. The workload and number of credits of the thesis should be increased.

With regard to the reasons for this decision the Standing Commission refers to the attached assessment report.

EXPERTS' REPORT

ON THE STUDY PROGRAMMES

- **INFORMATICS ENGINEERING (BACHELOR OF COMPUTER SCIENCE)**
- **COMPUTER ENGINEERING (BACHELOR OF ENGINEERING)**
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- **INFORMATION TECHNOLOGY (BACHELOR OF COMPUTER SCIENCE)**
- **COMPUTER SCIENCE (MASTER OF COMPUTER SCIENCE)**

OFFERED BY UNIVERSITAS BRAWIJAYA, MALANG, INDONESIA

Visit to the university: 22-26 August 2022

Panel of experts:

Prof. Dr. Zhen Ru Dai	Hamburg University of Applied Sciences (HAW Hamburg), Department Computer Science (Germany)
Prof. Dr. Gabriele Kunau	Fachhochschule Dortmund University of Applied Sciences and Arts, Faculty of Computer Science (Germany)
Prof. Dr. Marco Platzner	Paderborn University, Faculty for Computer Science, Electrical Engineering and Mathematics, Department of Computer Science (Germany)
Mr. Barata Antariksa	TVET school Bekasi 1 (Indonesia) (labour market representative)
Ms. Jessica Ziegler	Student of the Hasso-Plattner-Institute/University of Potsdam (Germany) (student representative)

Coordinator:

Alexandre Wipf, Annette Büning	AQAS, Cologne, Germany

I. Preamble

AQAS – Agency for Quality Assurance through Accreditation of Study Programmes – is an independent non-profit organisation, supported by more than 90 member institutions, both higher education institutions (HEIs) and academic associations. Since 2002, the agency has been accredited by the German Accreditation Council (GAC). It is therefore a notified body for accreditation of higher education institutions and programmes in Germany.

AQAS is a full member of ENQA and also listed in the European Quality Assurance Register for Higher Education (EQAR) which confirms that our procedures comply with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), on which all Bologna countries agreed as a basis for internal and external quality assurance.

AQAS is an institution founded by and working for higher education institutions and academic associations. The agency is devoted to quality assurance and quality development of both academic studies and teaching in higher education institutions. The activities of AQAS in accreditation are neither limited to specific academic disciplines or degrees nor to a certain type of higher education institution.

II. Accreditation procedure

This report results from the external review of the study programmes “Informatics Engineering” (Bachelor of Computer Science), “Computer Engineering” (Bachelor of Engineering), “Information Systems” (Bachelor of Computer Science), “Information Technology Education” (Bachelor of Education), “Information Technology” (Bachelor of Computer Science) and “Computer Science” (Master of Computer Science) offered by Universitas Brawijaya.

1. Criteria

Each programme is assessed against a set of criteria for accreditation developed by AQAS: the AQAS Criteria for Programme Accreditation (Bachelor/Master). The criteria are based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) 2015. To facilitate the review each criterion features a set of indicators that can be used to demonstrate the fulfilment of the criteria. However, if single indicators are not fulfilled this does not automatically mean that a criterion is not met. The indicators need to be discussed in the context of each programme since not all indicators necessarily can be applied to every programme.

2. Approach and methodology

Initialisation

The university mandated AQAS to perform the accreditation procedure in April 2021. The university produced a Self-Evaluation Report (SER). In December 2021, the institution handed in a draft of the SER together with the relevant documentation on the programmes and an appendix. The appendix included e.g.:

- an overview over statistical data of the student body (e.g. number of applications, beginners, students, graduates, student dropouts),
- the CVs of the teaching staff/supervisors,
- information on student services,
- core information on the main library,

- as well as academic regulations.

AQAS checked the SER regarding completeness, comprehensibility, and transparency. The accreditation procedure was officially initialised by a decision of the AQAS Standing Commission on 21 February 2022. The final version of the SER was handed in June 2022.

Nomination of the expert panel

The composition of the panel of experts follows the stakeholder principle. Consequently, representatives from the respective disciplines, the labour market, and students are involved. Furthermore, AQAS follows the principles for the selection of experts defined by the European Consortium for Accreditation (ECA). The Standing Commission nominated the aforementioned expert panel in June 2022. AQAS informed the university about the members of the expert panel and the university did not raise any concerns against the composition of the panel.

Preparation of the site visit

Prior to the site visit, the experts reviewed the SER and submitted a short preliminary statement including open questions and potential needs for additional information. AQAS forwarded these preliminary statements to the university and to all panel members in order to increase transparency in the process and the upcoming discussions during the site visit.

Site visit

After a review of the SER, a virtual site visit to the university took place on 22-26 August 2022. The virtual site visit was realised using online video-conferencing sessions. AQAS and the panel of experts were located in Germany and were connected individually by audio and video. Some participants of UB, especially the management, were sitting in one large conference room equipped with a professional conference system. Other participants of UB were connected individually, many of them with live video. In most sessions the number of participants was so large that it was displayed over several pages of the video-conferencing programme. For the discussions translators were available in each session. The chat was used to provide room for more answers and follow-up questions. Online, the experts interviewed different stakeholders, e.g. the management of the higher education institution, the programme management, teaching and other staff, as well as students and graduates, in separate discussion rounds and consulted additional documentation as well as student work. The visit concluded by the presentation of the preliminary findings of the group of experts to the university's representatives.

Reporting

After the site visit had taken place, the expert group drafted the following report, assessing the fulfilment of the AQAS Criteria. The report included a recommendation to the AQAS Standing Commission. The report was sent to the university for comments.

Decision

The report, together with the comments of the university, forms the basis for the AQAS Standing Commission to take a decision regarding the accreditation of the programmes. Based on these two documents, the AQAS Standing Commission took its decision on the accreditation on 5 December 2022. AQAS forwarded the decision to the university. The university had the right to appeal against the decision or any of the imposed conditions.

In January 2023, AQAS published the report and the result of the accreditation as well as the names of the panel of experts.

III. General information on the university

Universitas Brawijaya (UB) is a public university located in Malang, East Java, Indonesia. It was founded in 1963, has three campuses, 15 faculties and 1 Postgraduate School and offers 177 study programmes (Diploma programmes, vocational programmes, Bachelor's, Master's and PhD programmes) to approximatively 69,000 active students. UB employs close to 2,100 lecturers and about 1,900 education staff.

The university purses a *Tridharma* of higher education, research and community service interlaced. It has defined its vision and mission at university level, as well as at faculty level. The university operates within the framework of a Long-Term Development Plan 2019-2039, refined in a Strategic Plan 2020-2024. Specific goals and performance targets have been defined in the areas of governance, innovation, reputation, alumni, faculty, funding, and efficiency. The main goal of UB is to become a global competitive university. At faculty level individual strategic plans are based on and refer to UB's overall Strategic Plan. Additionally, there is a Research Master Plan 2021-2025 for the whole university referring to the National Research Master Plan and National Research Priority of the Indonesian authorities.

The Faculty of Computer Science offers a total of 6 programmes and is divided in 2 departments: the Department of Informatics Engineering offering the Bachelor's programme of Informatics Engineering (BPIF), the Bachelor's programme of Computer Engineering (BPCE) and the Master's programme of Computer Science (MPCS) as well as the Department of Information Systems offering the Bachelor's programme of Information System (BPIS), the Bachelor's programme of Information Technology (BPIT), and the Bachelor's programme of Information Technology Education (BPITE). The missions of the faculty are 1) to provide education in the field of Information Technology and Computer Science that sustainably achieves international quality and standards, 2) to improve the ability of the academic community in developing research and service that is in line with the needs of industry and society, 3) to integrate the development of education, research, and community service supported by transparent, accountable, effective, and efficient organisational governance, and 4) to realise sustainable cooperation in the fields of education, research, and community service on a national and international scale. The faculty is home to 3,828 active students and employs 115 lecturers and 65 support staff.

IV. Assessment of the study programmes

1. Quality of the curriculum

Bachelor/Master degree

The intended learning outcomes of the programme are defined and available in published form. They reflect both academic and labour-market requirements and are up-to-date with relation to the relevant field. The design of the programme supports achievement of the intended learning outcomes.

The academic level of graduates corresponds to the requirements of the appropriate level of the European Qualifications Framework.

The curriculum's design is readily available and transparently formulated.

[ESG 1.2]

Overarching information

One academic semester at UB consists of 16 weeks including 14 lectures/meetings, 1 mid-term and 1 final exam. The workload of students and staff is assessed based on the SKS credit system, whereby 1 SKS amounts to a total of 170 minutes of face-to-face meetings, self-study, and structured assignments. UB uses a conversation table of SKS to ECTS, according to which 1 SKS corresponds to 1.5 ECTS. The university and

faculty have set a general frame for the curricula of Bachelor's programmes, they should include nation-wide compulsory courses, university-wide compulsory courses, faculty compulsory courses, programme compulsory courses and electives.

For each programme, the programme leaders have defined Programme Learning Outcomes (PLO) as well as graduate profiles, in turn Intended Learning Outcomes (ILO) and then learning outcomes at the level of the courses. Learning outcomes are divided in four categories: attitude, knowledge, general skills, specific skills. UB states that the curricula refer to the Indonesian National Qualifications Framework (KKNI), at level 6 for the Bachelor's programmes and at level 8 for the Master's programme. In addition, the programme leaders should also consider the national higher education standards as well as input from companies and industry representative bodies and conduct benchmarking exercises with other universities. A general curriculum update is planed every four years.

UB states that one of its main goals is to improve the graduates' employability. Accordingly, it indicates that, among others, the programmes to be reviewed include internships and allow students to take courses outside of their study programme in the framework of the national Independent Campus/Freedom to Learn policy (MBKM).

Experts' evaluation

Generally, and as overarching matters for all study programmes, the experts would like to start by highlighting two aspects, namely the possibility to switch between the programmes and the international mobility of students and graduates.

Currently, the students wishing to switch their study programme must go through the common application procedure as a freshman and start again from the first semester onwards. In order to provide students with more opportunities and to avoid 'losing' time due to a change of interest or a false understanding of the studies when applying as a high school student the experts recommend changing this practice. The university should facilitate the switch from one Bachelor's programme to another Bachelor's programme for the students, based on a simple recognition procedure (**Finding 1**).

Currently, UB has a strong international exchange programme within Asia and with Australia. Further internationalisation efforts should be strengthened to attract international students from western countries, especially from Europe and the US (**Finding 2**, see also Chapter 4). International student exchange and participation opportunities at international conferences for senior students in their fourth year are important to gain a worldwide reputation. Since tuition for foreign students is relatively high, potential exchange candidates might need more support in finding the right scholarship to make the exchange programmes more attractive.

Typical European Computer Science Bachelor's programmes amount to 180 credits (ECTS) in total. The Computer Science programmes at UB vary, with different numbers of credits. Therefore, it might be difficult for UB graduates to apply for Master's programmes worldwide. In such a case, the graduates have to catch up on some Computer Science courses before their application. The programme leaders might want to check the number of credits they have allocated to their courses, to support the competitiveness of UB graduates internationally. Here, it would be especially beneficial to summarise the different courses leading to the final thesis into one overarching/meta-module showing the total number of credits allocated to these activities (**Finding 3**, see also underneath).

Informatics Engineering (Bachelor)

Description

The Bachelor's programme "Informatics Engineering" (BPIF) covers 8 semesters and 144 SKS. It has at the time of the submission of the self-evaluation report 1,389 active students; the yearly intake is set at 260 students. Upon graduation students are awarded a Bachelor of Computer Science, or S.Kom.

The main focus of the programme lies on fundamental-theoretical aspects of the computer science/informatics field alongside with their application and practical aspects. Some of the main topics studied include mathematics and statistics, algorithms and programming, intelligent systems, software engineering, computer architecture, and networking as well as life skills. UB mentions four specific career paths for the programme's graduates: 1) developing full-stack and multi-platform software to fulfil the needs of the industry, 2) developing IT supporting infrastructure with regards to security, scalability, and performance, 3) developing smart computing solutions to solve real-world problems through research and entrepreneurial activities, and 4) designing a data-driven solution including data storage and engineering as well as its analysis and presentation. UB states in its self-evaluation report that the curriculum has been developed using labour market feedback as well as considering recommendations from the Indonesian computing association (APTIKOM) and the ACM Computing Curricula 2020. The programme leaders defined 3 programme learning outcomes and 14 intended learning outcomes. The graduates should thus be able to implement basic principles of the engineering methodologies including problem-identification as well as designing, implementing, and evaluating its solution. They should have a strong theoretical and practical understanding of computer science subjects. Finally, the graduates should be capable to develop a *technopreneurship* mindset in a broader sense through lifelong learning, character development, and active collaboration.

The curriculum is composed of 4 general compulsory courses (8 credits, e.g. Citizenship, Indonesian), 5 university compulsory courses (18 credits, Thesis worth 6 credits, Internship worth 4 credits, Entrepreneurship, English, Community Service), 26 faculty and programme compulsory courses (90 credits, e.g. Operating System, Statistics and Probability Theory, Human-Computer Interaction, Introduction to Machine Learning) and programme elective courses (28 credits). In the programme the faculty offers a total of 50 elective courses, which are divided in six streams: Full-Stack (e.g. Software Project Management), Interactive Media (e.g. User Experience Design), Network and Cloud Engineering (e.g. Wireless Network), Cyber Security (e.g. System Security), Data Science (e.g. Data Engineering), Smart Computing (e.g. Evolutionary Algorithm).

Experts' evaluation

The BPIF programme has started in 2007 and is the oldest Computer Science study programme at UB. BPIF is the best-established Computer Science study programme at the UB with a well-defined and plausible curriculum. The courses correspond to international standards in Computer Science – and to the expected level of competencies for Bachelor graduates according to the national and European qualifications frameworks. The courses are well-implemented and supported by pre-defined learning outcomes. The learning and teaching approach are also good.

Social and societal aspects are important modules in the programme. Different independent learning tracks make this study programme even more attractive to students.

The programme is designed in student-friendly manner and gives the students the possibility to shorten the study time when wished (so-called fast-track). A monitoring system observes and intercepts students' study progress (see also Chapters 3 and 6).

In practise, the course material is standardised and frequently updated in the department and taught by trained lecturers. Students are required to attend the lecture courses and the labs which are supervised by a large

lecturer's team. Graduates from BPIF are highly sought after by the labour market. The labour market is periodically consulted by the department to improve their curriculum.

Conclusion

The criterion is fulfilled.

Computer Engineering (Bachelor)

Description

The Bachelor's programme "Computer Engineering" (BPCE) covers 8 semesters and 144 SKS. It has at the time of the submission of the self-evaluation report 665 active students; the yearly intake is set at 160 students. Upon graduation students are awarded a Bachelor of Engineering, or S.T.

The main field of the programme are computer system designs. The programme concentrates on the science and technology of the design, construction, implementation, and maintenance of software and hardware components of modern computing systems, computer control devices, and intelligent device networks. UB states that the programme graduates should find employment as computer technicians, network administrators, programmers, engineers of industrial machinery and communication devices, entrepreneurs, and educators in computer fields. The programme leaders have defined 3 programme learning outcomes and 11 intended learning outcomes. Accordingly, the graduates should have the ability to apply engineering principles on specific purpose computer systems that are reliable, fault tolerant and high performing both on data processing and communication interfacing. They should have the ability to study and analyse computer systems, both systems currently implemented in the field and conceptual systems that are still in the form of designs. Finally, they should also have the ability to manage computer systems and systems around them, including entrepreneurship, communication skills and building partnership. UB states that the programme has been developed according to the corresponding curriculum recommendations of ACM and of the Indonesian computing association (APTIKOM).

The curriculum is composed of 4 general compulsory courses (8 credits, e.g. Religion, Pancasila), 5 university compulsory courses (18 credits, Thesis worth 6 credits, Internship worth 4 credits, Entrepreneurship, English, Community Service), 6 faculty compulsory courses (17 credits, e.g. Basic Programming, Professional Ethics), 22 programme compulsory courses (73 credits, e.g. Computer Security, Linear System, Electronic Physics, Applied Database, Electronic Circuit I & II) and programme electives (28 credits, a total of 27 electives are offered, including Aerial Robotics, Robot Kinematics, Control System, Data Flow Programming, Mobile Device).

Experts' evaluation

The programme learning outcomes (PLO) and intended learning outcomes of graduates (ILO) are in line with the desired qualifications. The programme is said to be structured according to the ACM curriculum guidelines for Computer Engineering programmes. By and large, the BPCE programme matches these guidelines and thus follows an internationally accepted and known programme structure. During the digital site visit, industry representatives reported that BPCE graduates are well prepared for the national labour market and are in high demand. This feedback proved that labour market requirements are excellently reflected in BPCE.

BPCE's curriculum comprises compulsory courses required for such a programme, and an attractive and sufficient set of elective courses. Combining contents of Computer Science and, to a smaller extent, Electrical Engineering related courses, the programme is interdisciplinary per se, and provides graduates with a very good mix of subject-related, methodological, and general skills.

The academic degree is comparable with the corresponding level of the European Qualifications Framework. The total student workload of 216 ECTS (240 ECTS when students decide to take additional electives or additional out of campus courses) exceeds that of typical European Bachelor's programmes, but with a longer nominal study duration and a set of general courses not found in European programmes.

The assigned credits for mathematics education and for the Bachelor's thesis are lower than what would be expected from comparable European study programmes. In the view of the experts this will greatly reduce the opportunities for BPCE graduates to get admission to European Master's programmes, that check for credit thresholds in several subject areas, common thresholds being 20 ECTS in mathematics and 12 ECTS for the Bachelor's thesis. Hence, the following two recommendations:

- to increase the credits for the compulsory mathematics education from currently 14 ECTS to at least 20 ECTS (**Finding 4**). While the contents of the current three compulsory courses seem to include all necessary topics, the student's occupation with the topics could be reinforced to justify a higher number of credits,
- to group the "Bachelor Thesis" (9 ECTS) with the thesis-related course "Research Methodology and Scientific Writing" (4.5 ECTS) into one module of 13.5 ECTS in the transcript, as it is already shown in some figures in the self-evaluation report (**Finding 3**, see above).

Conclusion

The criterion is fulfilled.

Information Systems (Bachelor)

Description

The Bachelor's programme "Information Systems" (BPIS) covers 8 semesters and 144 SKS. It has at the time of the submission of the self-evaluation report 874 active students; the yearly intake is set at 200 students. Upon graduation students are awarded a Bachelor of Computer Science, or S.Kom.

The focus of the programme lies on using technology for positive gains across society, both economic and humanistic. Thematically, the programme covers quantitative and qualitative methods, human factors in technology, and business perspectives on technology as well as technological aspects such as system design and computational logic subjects. UB states that the graduates should find employment as Information System Developers, Information System Managers, Data Managers and Scientists, or Information System Administrators. The programme leaders have developed 4 programme learning outcomes and 7 intended learning outcomes. The graduates should thus have the ability to develop and implement applications and programmes for the backend processing systems used in businesses and organisations. They should be able to manage, design, and monitor information systems in a variety of settings. The graduates should also have the ability to design data modelling processes to create algorithms and predictive models and perform custom analysis and manipulate large data sets and use them to identify trends and reach meaningful conclusions to inform strategic business decisions. Finally, they should have the ability to take responsibility for the configuration, upkeep and reliable operation of a company's network and computer systems in various organisations. UB states that the programme was developed by taking into consideration the recommendations of ACM and of the Indonesian computing association (APTIKOM).

The curriculum is composed of 4 general compulsory courses (8 credits, e.g. Citizenship, Pancasila), 5 university compulsory courses (18 credits, Thesis worth 6 credits, Internship worth 4 credits, Entrepreneurship, English, Community Service), 6 faculty compulsory courses (17 credits, e.g. Basic Programming, Research Methodology and Scientific Writing), 23 programme compulsory courses (71 credits, e.g. Data Communication

Networks, Statistics, Enterprise Architecture, Information Systems Implementation and Evaluation, Data Warehouse) and programme electives (30 credits, a total of 24 elective courses are available, including Big Data and Analytic, Advanced Geoinformation 1 and 2, E-Government, Technopreneurship).

Experts' evaluation

Teaching at UB is guided by a process of outcome-based education (OBE). Desired qualifications are to be described in form of graduate learning outcomes (CPL) and course learning outcomes (CPMK). For BPIS, learning outcomes can be found in 3 places:

- The "Curriculum Book Bachelor of Information Systems Study Programme" breaks down the above-mentioned focus of BPIS into 4 programme learning outcomes (PLO), which seem to correspond to CPL, and 7 intended learning outcomes (ILO). The Course Syllabus in the same document describes course learning achievements (CLA) which are mapped to CPL; they are further detailed by sub-course learning achievements (SUB-CLA) for each course.
- A more high-level description is given for each course in the documents provided as annexes to the self-evaluation report; here one or more of the 7 ILO are referenced for each course.
- The most detailed description can be found in the RPS documents (Semester Teaching Plan/Semester Lesson Plan) for which some examples were provided in English. Here, the 7 ILO are referenced for each course which is then described in detail using CPMK and SUB-CPMK.

Each document in itself describes the study programme and courses in a valid way, addressing different levels of learning outcomes. Especially the 4 PLO and 7 ILO in the Curriculum Book describe a valid study programme for information systems according to the ACM's Computing Curricula 2020. The syllabus as well as the students' statements during the site visit indicate that the PLO and ILO are implemented well. The courses are adequate to support the intended learning outcomes of BPIS. The students also gave examples of projects they carry out during their short semester of community service: Teaching in villages and rural areas on the topic of technology and "making villages more digital", e.g. by providing a digital map. Here, the students are able to use their theoretical knowledge about information systems for real projects. In addition, they deepen their social skills. The representatives of the labour market confirmed that BPIS graduates are well prepared for a first employment. The competencies of the graduates correspond well to the expected competencies of Bachelor graduates according to the Indonesian national qualification framework and according to those of the European Qualifications Framework.

The course flow diagrams in the Curriculum Book provide alternative ways to successfully graduate in BPIS (see also Chapter 6). They include dependencies between courses as well as options for electives and options for semesters outside of UB. Information about the goals, contents and formal attributes (mandatory vs. elective, credit points, etc.) of each course can be found in the 3 sources listed above. The very detailed course descriptions in the RPS include several tasks and examinations during the semester. Based on this, the students know at any point of study how they are progressing in relation to the programme's requirements.

The combination of general mandatory, university mandatory, faculty mandatory and major mandatory courses ensures that the students learn specifics of information systems as well as cross-subject and general skills. Disregarding a few mistakes which might result from translation to English, the workload and dependencies within the curriculum are well documented. The total amount of credits (144 SKS / 216 ECTS) is rather high compared to a typical European undergraduate programme. The same applies to the required workload. This topic is addressed for all programmes in Chapter 3 of this report.

The curriculum presented for this accreditation differs from a previous version of 2016. The differences are documented in the Curriculum Book, which also contains rules for students who are affected by both versions. From a European point of view on "Business Informatics" it is surprising that the course "Enterprise Systems"

(CIS61028) was moved from a mandatory to an elective. It was explained during the site visit that this change was necessary because room was needed for mandatory courses of “Independent Learning”. Although it was said that the decision was made in agreement with requirements from the labour market, not all representatives of the labour market the experts talked to during the site visit agreed. The decision is however in line with the ACM’s Computing Curricula 2020 for Information Systems. Therefore, the fact is included in the report without any further consequences.

On a formal level however, the documents listed above do not correspond well with each other. It is unclear why the course descriptions in the Curriculum Handbook – although they are more detailed than other documents provided in the annexes to the self-evaluation report – do not refer to the 7 ILO. When comparing the 3 types of documents for the course CSD60003 “Enterprise Architecture” major differences can be found. They are summarised in the following table:

CSD60003 “Enterprise Architecture”		
RPS	**Curriculum Book BPIS**	**Annex 3.1.48 “Enterprise Architecture”**
IS-ILO 1 IS-ILO 2		IS-ILO 1
CPMK M1 … M4	CLA 1 … 8	8 subject aims
SUB-CPMK L1 … L15	SUB-CLA 1.1 … 8.4 (total of 25)	

Neither the names nor the number of goals and sub-goals match. There are major structural differences between the documents. The references to the ILO differ: While the RPS includes ILO 1 and 2, the annex-document only refers to ILO 1. The subject aims listed in the annex-document do match the 8 CLA of the Curriculum Book. Still, comparing the CPMK and SUB-CPMK in the RPS with the CLA and SUB-CLA in the Curriculum Book shows that these 2 documents describe the goals in quite different ways.

Another problem is that the examples of RPS provided for BPIS differ greatly in the amount of information provided. The RPS for CSD60003 does not contain complete information about the assessment of the courses. Other than in the RPS for CSD60007 (“Digital Financial Platform”), the documents do not provide information about the midterm and final examinations. The worksheets listed for weekly assessment are given no weight, “because it serves as a formative evaluation tool”. Only one worksheet has been provided in this RPS (whereas CSD60007 includes more). As a result, it is unclear how the assessment for this course is organised. The document provided for CIS61028 seems to be more complete.

In the view of the experts these aspects need to be improved: The university must provide an integrated set of documentation for the BPIS course syllabus that describes the contents of the courses including the learning outcomes and methods of assessment. These descriptions must use the same structure and nomenclature, be complete and must not contain any discrepancies (**Finding 5**).

For several courses the literature and material listed in the Curriculum Book is older than the sources listed in the RPS. It is recommended that the lists in the Curriculum Book be updated (**Finding 6**).

Conclusion

The criterion is partially fulfilled.

Information Technology Education (Bachelor)

Description

The Bachelor's programme "Information Technology Education" (BPITE) covers 8 semesters and 144 SKS. It has at the time of the submission of the self-evaluation report 336 active students; the yearly intake is set at 80 students. Upon graduation students are awarded a Bachelor of Education, or S.Pd.

The programme concentrates on the areas of didactic methods, integration, data modelling, and information technology engineering. Students are trained to become prospective teachers. UB states that the curriculum was developed based on the Teacher Education Standards of Indonesia, the TPACK Framework and recommendations of the Indonesian Information Technology and Vocational Education Association (PVKTII). The programme leaders have formulated 5 programme learning outcomes and 12 intended learning outcomes. Accordingly, the graduates should be strong in the planning and development of teaching programmes based on scientific design principles, educational science foundations, and information technology transformation principles under the conditions of the teaching environment, the form of learning space and time, the development of science in the field of information technology, student characteristics, curriculum substance, and applicable education policies. They should also be proficient in developing and managing information systems and information technology services to support technology-based operational processes. The graduates should be proficient in planning, designing, implementing, analysing, redesigning, evaluating, and documenting the design of online and offline learning solutions by considering the needs of learning interactions, learning experiences, and instructional approaches. They should be skilled in collecting, designing, processing, analysing data sources in large quantities, both structured and unstructured, be able to reveal a pattern using computational and statistical approaches to find solutions and produce useful information in decision-making. Finally, the graduates should be capable of thinking critically and creatively in designing products and services in information technology and mastering legal and business ethical aspects in the field of information technology.

The curriculum is composed of 4 general compulsory courses (8 credits, e.g. Religion, Indonesian), 5 university compulsory courses (18 credits, Thesis worth 6 credits, Internship worth 4 credits, Entrepreneurship, English, Community Service), 6 faculty compulsory courses (17 credits, e.g. Introduction to Computer Science, Computational Mathematics), 28 programme compulsory courses (71 credits, e.g. Teaching and Learning Theory, Data Science Fundamentals, Computer Network, Microteaching and Classroom Management) and programme electives (30 credits, a total of 40 electives are offered, including Datawarehouse, Experience Learning Design, Network Security, E-Learning Design and Development, Educational Game Development). The programme includes a school internship, an industry internship, and a community service.

Experts' evaluation

Overall, the curriculum is very impressive. BPITE is doing a very good job in educating students in Information Technology Education. During the virtual site visit, all information regarding the study programme was very clear and consistent. It showed that all stakeholders are very motivated to achieve a high-quality programme and very engaged in improving the quality of the study programme. The programme was presented thoroughly, and all questions were answered clearly and openly. Based on self-evaluation report and appendices, the programme is clearly and transparently elaborated. Yet, when considering the mission of BPITE, regarding the establishment of cooperative relationship with industrial and non-industrial parties, the experts suggest to rather refer to education and non-education parties since the goal of BPITE is to produce professional educators so the word 'education' should be used first in the mission statement.

The desired qualifications to be achieved are fully presented as intended learning outcomes. They also include subject-specific and interdisciplinary elements quite well. There appears however to be a small gap between

the stated desired qualifications and the goal of BPITE. BPITE's main goal is to produce professional educators in the field of information technology. In the view of the experts and especially in the view of the labour market (i.e. schools), educators in the field of information technology must have two general skills, educating and practicing. UB indicates that one desired qualification is that graduates can develop and manage systems and information technology, develop content and interactive learning media, become scientists in the field of education, or entrepreneurs in the field of information technology (*techno-edu-preneur*). These qualifications seem to be rather those of a practitioner of information technology and less of an educator of information technology. Although in general that is not a problem, a more focused description might be better. The experts consider that this is only a general description of what the graduates can do beside teaching or beside acting as educators in school, both high school and vocational school – therefore they do without a recommendation.

Based on the 5 programme learning outcomes BPITE defined 12 intended learning outcomes including knowledge, specific skills, general skills, and attitude aspects. During the online site visit, the staff have explained and answered all questions regarding these intended learning outcomes in a good way. The ILOs completely reflect academic/scientific elements so that the graduates do not have to wait more than two or three months to get a job (as the staff explained) and most of them join the relevant sector, i.e. education/schools. However, when referring to the goal of BPITE of producing professional educators, the ILOs should include an attitude aspect which relates to professional teachers (**Finding 7**). This is very important for the professional educators to acknowledge the real attitude of educators facing their students, because being an educator is different from being an instructor. In their current form, the intended learning outcomes defined by BPITE seem to not completely reflect labour market requirements if graduates are mostly to become school educators.

Since the students of BPITE, in accordance with staff explanation, must take part in both PLP (introduction to school programme, i.e. a school internship) and an industrial internship, their acceptability in school and industry is well monitored in the programme. BPITE can evaluate in this way the relevancy of intended learning outcomes with the school and industry needs.

From the interview session with labour market representatives and alumni the experts conclude, in general, that UB has proven the appropriateness of the learning outcomes based on information provided by the labour market representatives. Unfortunately, UB and the faculty could not provide specific data on whether the alumni of BPITE work as teachers in school or as educations/trainers in industry. Only overarching data on waiting time following graduation and on the appropriateness of their job (broadly education & IT) could be provided. The experts therefore recommend that the university provides in the future full information on the profile of the BPITE graduates and the sectors in which they are employed following graduation (schools, education/training, industry) (**Finding 8**). Additional information from labour market representatives during the site visit would also be helpful in the future.

UB awards the academic degree S.Pd (Bachelor of Education) to the students who have completed all courses and the thesis under the BPITE study programme. The academic degree corresponds well to the intended learning outcomes. The 12 ILOs defined by BPITE are aligned with level 6 of the EQF and are based on the scientific vision of the programme. In addition, BPITE's ILOs are also based on the conformity with the Indonesia Minister of Research, Technology and Higher Education Regulation 55/2017 concerning Teacher Education Standards; and the TPACK (Technological, Pedagogical, And Content Knowledge) Framework. The TPACK framework is used as a guide to map the main competencies that prospective teachers in the study field must possess in an information technology-based learning environment.

The BPITE curriculum was developed with an Outcome-Based Education (OBE) approach under guidelines from the Indonesian Ministry of Education and Culture in 2020. The PLO and ILO formulations were then used as the basis for determining the body of knowledge and designing the content of the BPITE curriculum.

Conformity to these guidelines ensures the alignment between programme learning outcome, intended learning outcome, course learning outcome, the scientific vision programme, employability skills possessed by graduates, and the needs of IT teachers or professional IT practitioners. The curriculum is designed with a spiral model which refers to a curriculum design in which key concepts are presented repeatedly throughout the curriculum, but with deepening layers of complexity or in different applications. Thus, integrating course offerings in the curriculum is grouped based on complexity, scientific content (domain), and specificness.

BPITE classifies courses into three groups, based on complexity, i.e., fundamental, advanced, and applied. Fundamental and advanced courses emphasise mastery of theories, concepts, and simulations of solving conceptual/theoretical problems/cases. Fundamental courses need to be completed as a requirement to take advanced courses since the fundamental courses have a lower grade of complexity than the advanced ones. Applied courses emphasise solving factual problems or cases in schools/industry through teaching practice activities in schools or work practice in the industry.

Beside the above 3 groups of courses, BPITE has also 8 groups of courses that are divided based on scientific content (domain). Course domain clustering is based on the TPACK Framework, i.e., Content Knowledge Course (CK), Pedagogical Knowledge Course (PK), Technological Knowledge Course (TK), Pedagogical Content Knowledge Course (TPK), Technological Content Knowledge Course (TCK), Technological Pedagogical Knowledge Course, Technological Pedagogical Content Knowledge Course (TPCK; Research and Fieldwork Course), and General Course (G). Generally, there are 28 compulsory programme-specific courses and 40 elective programme-specific courses available. The independent study courses comprise of 13 elective courses. Students can take programme-specific courses outside of BPITE. The cross-subject knowledge is not explicitly stated in the group of courses, but the experts assume that the 13 elective courses can be taken as the cross-subject knowledge for BPITE students because they can be taken outside of BPITE.

BPITE reviews and updates the curriculum in 2 ways, short- and long-term. The short-term update aims to review, adjust, or correct each semester based on the actual implementation of the semester lesson plan document in the lecture process. In the short-term BPITE makes minor modifications or improvements. Long-term updating aims to review, adjust, or improve every 4 years based on the suitability of the target and actual curriculum content against the scientific vision of the study programme and the level of graduate learning achievement targeted by the curriculum. BPITE makes major modifications or improvements and involves internal (staff of BPITE) and external parties (school and industry) in this term. Internal parties are involved through learning workshops before the upcoming semester starts, and Focus Group Discussions, which are both aimed at updating the learning process in the past semesters, the education administration, the curriculum being implemented, and the Semester Lesson Plans for each subject. Curriculum review by external parties is carried out by receiving feedback from stakeholders such as information technology education experts, user organisations/agencies and prospective users of graduates from both schools and industries in the field of information technology, associations of the Indonesian Information Technology and Vocational Education Association (PVKTII), and alumni. BPITE also holds discussions with industry and other universities abroad through the Visiting Professor and Professional Programme every year. Based on this, the experts believe that the process of regularly reviewing and updating the curriculum has made great contributions to improve the quality of the programme. The changes made in the past have been transparently documented.

Finally, it can be stated that all courses are described transparently and that an idealised typical course plan is available. The workload is calculated correctly.

Conclusion

The criterion is fulfilled.

Information Technology (Bachelor)

Description

The Bachelor's programme "Information Technology" (BPIT) covers 8 semesters and 144 SKS. It has at the time of the submission of the self-evaluation report 479 active students; the yearly intake is set at 120 students. Upon graduation students are awarded a Bachelor of Computer Science, or S.Kom.

The curriculum concentrates on the development and management of integrated and effective information technology. According to information in the self-evaluation report the programme has been developed by considering the Computing Curricula guidelines of ACM. There are 4 graduate profiles for the programme: Systems Integration Engineer, Information Technology Infrastructure and Security Manager, Service-Based Application Developer, Data and Information Manager. The programme leaders formulated 4 programme learning outcomes and 9 intended learning outcomes. Accordingly, the graduates should have the ability to develop system integration which includes integration between elements of technology (software, hardware, and data). They should have the ability to select, design, deploy, integrate, and manage the Information Technology network, infrastructure, and security within an organisation. The graduates should also have the ability to perform demands and requirements analysis, design, implementation, and evaluation in the development of service-based applications. Finally, the graduates should have the ability to utilise the Information Technology component in managing data.

The curriculum is composed of 4 general compulsory courses (8 credits, e.g. Citizenship, Pancasila), 5 university compulsory courses (18 credits, Thesis worth 6 credits, Internship worth 4 credits, Entrepreneurship, English, Community Service), 6 faculty compulsory courses (17 credits, e.g. Computational Mathematics, Computer Architecture and Organization), 28 programme compulsory courses (88 credits, e.g. Basic Information System Development, Database System, Algorithms and Data Structures, Internet Protocol and Architecture, Integrative Programming) and programme electives (13 credits, a total of 17 electives are offered, including Applied Networks, Digital Forensic System, Geographic Information System).

Experts' evaluation

Based on the self-evaluation report, the discussions with all stakeholders during the site visit, the evidence provided and intensive discussions within the panel of experts the experts come to a mixed conclusion regarding the Bachelor's programme of Information Technology.

On the one hand, the content of the curriculum fits well with the descriptions provided and the goals of the university and programme leaders. The intended learning outcomes and graduate profiles correspond to the requirements of the labour market. The data provided shows and confirms that the graduates are employable. The labour market confirmed that graduates perform well and that there is a need for persons with this specific skillset. The students confirmed that the study programme is interesting and that they feel well prepared for the labour market. The examples provided during the discussions regarding the teaching and learning material (including videos, semester lesson plans etc.) and arrangements (incl. groupwork), the internships conducted by the students and the community practice were all positive. The programme leaders also demonstrated that the curriculum's content is based on a specific profile developed by ACM/Association for Computing Machinery. The contents and the study programme implementation are therefore adequate and fit for purpose.

On the other hand, the experts concluded that the overall programme suffers from specific shortcomings.

The programme leaders mentioned that BPIT has a more applied approach to Computer Sciences compared to the BPIF study programme. This is generally plausible and not a problem per se. They also mentioned that differentials and integrals are areas of mathematics that are not required in this study programme. According to them, the focus of BPIT lies on the "technical requirements" of IT in organisations. Examples of student

internships support this statement (internship at a telecommunication company, working on microservice projects, working in the security field at a banking institution). Yet, in the view of the experts this profile does not correspond to an academic degree of Applied Computer Sciences according to European standards. The material provided including information on the final project/thesis by the students lead the experts to believe that the specific content of the programme and the level of skills gained by the students rather corresponds to the German vocational training course of IT Specialist / *Fachinformatiker/in* – which is aligned to level 4 (and not 6) of the German national qualifications framework (thus, EQF level 4).

In addition to academic degrees, UB offers Diploma III and Diploma IV degrees which are more practice oriented and offer a more vocational rather than academic education. According to the Indonesian national qualifications framework, Diploma IV degrees correspond to Bachelor's degrees with a different focus and are therefore aligned to EQF level 6. In the area of Computer Science, UB offers a Diploma IV degree in Information Technology, with concentrations in Information System, in Information and Computer Technology, in Digital Business and E-Commerce, or in Film and Television. This degree was not part of the present accreditation procedure – yet the difference between the BPIT study programme and the Diploma IV course on the same topic could not be clarified during the site visit.

In conclusion, the university must demonstrate how BPIT trains students at the Bachelor's level according to the National Qualifications Framework (KKNI) and the European Qualifications Framework (EQF). The differences with a vocational Diploma programme in Information Technology must be made clear. Changes to the programme and course learning outcomes and/or curriculum of BPIT might be required to reach a qualification at EQF level 6 (**Finding 9**). A detailed matrix between programme learning outcomes, courses, qualifications framework indicators accompanied by a comparison with the vocational Diploma IV course might be best suited to demonstrate that students are trained at the appropriate level 6 KKNI/EQF.

Conclusion

The criterion is partially fulfilled.

Computer Science (Master)

Description

The Master's programme "Computer Science" (MPCS) covers 4 semesters and 40 SKS. It has at the time of the submission of the self-evaluation report 85 active students; the yearly intake is set at 25 students. Upon graduation students are awarded a Master of Computer Science, or M.Kom.

The goal of the programme is to equip students with knowledge and skills related to science and technology in the field of Computer Science, especially in the fields of Intelligent Systems, Computer Vision, Robotics and Embedded Systems, Software Engineering, Information-Centric Networking, Information System, Technology-Enhanced Learning, and Geoinformatics as well as Media, Game and Mobile Technologies. The students should learn and internalise various state-of-the-art methods and technologies in their chosen field of interest. UB mentions the following graduate profile in its self-evaluation report: Advance Computer Science and Technology Developer. Accordingly, the programme leaders have formulated 1 programme learning outcome and 4 intended learning outcomes: Graduates should have the ability to develop innovative and tested advanced computer technology and computer science and apply it to solve complex problems.

The curriculum is divided in 3 groups of courses: Major Course, Thesis Research Course, Supporting Thesis Research Course. In the area of Major Courses the students take 21 credits of compulsory courses (Software Engineering, Intelligent System, Research Methodology & Scientific Paper Writing, Internet Network Architecture, Interaction Design, Algorithm & Computation Complexity, Information Technology Entrepreneurship,

Computational Science). The Thesis Research Courses are also compulsory and cover 13 credits (Research Induction, Thesis Proposal Supervision, Thesis Seminar, Scientific Publication, Thesis worth 5 credits). Thesis Research Support Courses are electives, students should take 2 courses for a total of 6 credits (e.g. Advanced Computer Network, Special Topics in mobile Application, Advanced Data Mining). Students with a non-linear background must take an additional 12 credits worth of so-called bridging or matriculation courses: Algorithms and Programming, Computational Mathematics, Computer Networking, Basis Data. According to information in the self-evaluation report students must publish at least one scientific article and complete their master thesis in order to graduate.

Experts' evaluation

The programme learning outcomes (PLO) and intended learning outcomes of graduates (ILO) are in line with the desired qualifications. The curriculum comprises 3 types of courses, the compulsory major courses, the elective courses supporting thesis research, and thesis research.

The curriculum structure is somewhat confusingly presented in the self-evaluation report, since some figures show 33 credits for the compulsory courses and 9 for the supporting course, but others list for the compulsory area only 18 credits plus 3 SKS and the workload for the electives is not specified. Moreover, it is also stated that students take a minimum of 40 credits, out of which 21 credits are compulsory courses and 6 credits are electives. These inconsistency issues might partly be due to an incomplete labelling of national SKS vs. European ECTS credits but could not be resolved during the virtual site visit. The structure of the programme and the amount of credits assigned to each course need to be checked and depicted consistently (**Finding 10**).

Interestingly, the Master's programme is open for graduates from a wide range of Bachelor's programmes. To bring students without a Computer Science related Bachelor's degree up to the required level, a set of matriculation courses is offered that cover foundations in Mathematics and Computer Science. The effectiveness of these courses cannot be evaluated yet, since up to now only students with a Bachelor's degree in Computer Science have been admitted.

The curriculum foresees a well-balanced set of compulsory courses and the set of electives offered is reasonably large and allows students to specialise in several areas of Computer Science. The thesis research courses comprise a set of very useful topics, in particular for preparing students for writing and publishing scientific papers. Overall, the curriculum corresponds to the needs of the labour market and allows for the development of competencies at the corresponding Master level of the national qualifications framework. The actual thesis however comprises only 5 credits (SKS), which is a fraction of typical Master's thesis workloads at European universities (close to 30 ECTS).

Overall, students must earn at least 40 SKS / 60 ECTS for completing the Master's programme. Compared to typical European Master's programmes with their 120 credits (ECTS), this is only half the workload within the same timeframe of 4 semesters. During the interactive sessions, it did not become clear why there is such a difference in the workload/semester calculation between Bachelor's (typically 144 SKS / 216 ETS) and Master's (about 40 SKS / 60 ECTS) programmes at UB.

The self-evaluation report emphasises that the Master's programme is research-oriented, but the number of credits assigned to the thesis is very low which does not support this goal. To support international student mobility the university should consider increasing the workload of the actual thesis (**Finding 11**) and summarising the different courses leading to the final thesis into one overarching module showing the total number of credits allocated to these activities (**Finding 3**).

Conclusion

The criterion is partially fulfilled.

2. Procedures for quality assurance

Bachelor/Master degree

The programme is subject to the higher education institution's policy and associated procedures for quality assurance, including procedures for the design, approval, monitoring, and revision of the programmes.

A quality-oriented culture, focusing on continuous quality enhancement, is in place. This includes regular feedback mechanisms involving both internal and external stakeholders.

The strategy, policies, and procedures have a formal status and are made available in published form to all those concerned. They also include roles for students and other stakeholders.

Data is collected from relevant sources and stakeholders, analysed, and used for the effective management and continuous enhancement of the programme.

[ESG 1.1, 1.7 & 1.9]

Description

UB sees quality assurance as a contributing instrument in reaching its university-wide strategic goals. The UB Quality Assurance Center is tasked with carrying out quality control, quality assurance and quality improvements in academic and non-academic fields and is assisted by Quality Assurance Groups at faculty level and Quality Assurance Units at programme level. The quality assurance / quality management system at UB refers to national standards for higher education including national accreditation criteria as well as the Indonesian National Qualifications Framework (KKNI). In addition, UB states that it takes into consideration the quality standards of the ASEAN University Network Quality Assurance (AUN-QA) as well as the requirements for ISO Quality Management Systems. UB has developed internal quality standards (8 Education Quality Standards: Graduate Competency, Learning Content, Learning Process, Learning Assessment, Lecturers and Education Personnel, Learning Facilities and Infrastructure, Learning Management, Learning Financing – as well as 8 Research Quality Standards and 8 Community Service Quality Standards), a quality policy, a quality manual – the faculties should decline the university-wide standards and performance indicators to their level. There are also Standard Operating Procedures and academic as well as non-academic guidelines (e.g. for student services). National compulsory accreditation takes place in a five-year rotation. UB is certified according to ISO 9001:2008.

The quality approach at the faculty follows the OSDAT-system: 1) establish a quality assurance organisation (O); 2) set up a system in the form of policy and document system (quality standards, quality manuals, procedure manuals and work instructions) (S); 3) implement the system (socialisation and guideline) (D); 4) conduct an Internal Quality Audit (one cycle of quality assurance) (A); 5) follow-up (T).

The Internal Quality Audit is conducted annually by UB's Quality Assurance Center in cooperation with the groups at faculty and programme level. Its goal it to check the implementation of the defined quality standards at faculty and programme level. Other instruments mentioned by UB are: satisfaction index, study evaluation, tracer study, evaluation of learning outcomes, curriculum evaluation, and evaluation of teaching and learning process. The students complete questionnaires at the end of every semester. Feedback from external stakeholders is compiled through the tracer study and so-called satisfaction surveys (for the programme "Information Technology Education" there is, for example, a junior-alumni survey, a senior-alumni survey, and an alumni-user survey). The faculty also states that it gathers feedback from the labour market through regular visits to companies and cooperation with industry partners. In addition, there is a complaints and suggestions mechanism called UB Care. There is an ethics code for students and staff covering, among others, discrimination prevention – UB also mentions regulations to counter and prevent plagiarism.

UB has provided data on the number of applicants and of students as well as data on graduation rates and study duration.

Experts' evaluation

The overall framework for quality assurance and quality management at the university and that the FILKOM faculty is transparent, documented, and well thought-through. It also appears to be well implemented based on the evidence provided, the feedback by students and labour market representatives given in the site visit, and the professional integrity of the lecturers. The different responsibilities are fully defined and clear.

This system corresponds to the different stages of the Plan-Do-Check-Act cycle. It is also clear that external views and feedback is gathered at different moments and for different purposes in evaluating the attainment of the intended learning outcomes by the students but also in reviewing the contents of the different curricula. The periodicity of the different actions is well defined and logical.

The standards used refer to the national regulations but also to additional recommendations by regional quality assurance networks. Subject-specific recommendations are also taken into account, which is a positive sign.

The evaluation covers not only the different sessions of a course, but lecturers are also required to review the teaching material each semester as part of the quality assurance process. Feedback is gathered through questionnaires completed on UB's academic platform. It may be surprising, compared to most higher education institutions in Europe, that taking part in the evaluation by completing the questionnaire each semester for each course is mandatory for the students. It was confirmed during the virtual site visit that this is indeed implemented throughout. The experts had access to the course evaluation questionnaire, which covers usual topics. However, it appears to be very lecturer-centred and less course- or student-centred. In the view of the experts the questionnaire should be developed further and address issues such as workload in more details (**Finding 12**). Lecturers receive the compiled results automatically and have access to the anonymised comments by the students. The students confirmed to the experts that the lecturers take their feedback into account and the lecturers convinced the panel that changes are implemented based on this feedback. Yet, it was also confirmed during the discussions that students are not informed directly (e.g. through a published report or direct discussions in class) of the results of the evaluation and of the actions taken on the basis of the feedback given by students. In the future, UB should find ways to inform the students on these two points (**Finding 13**).

The head of the department has access to summarised results for all courses. This data is also used in the staff evaluation. In case of repeated negative evaluations the head of the department and the head of the faculty can take organisational and/or disciplinary measures to remedy this situation.

Feedback is also gathered from alumni and the world of work through various mechanisms – including discussion rounds with alumni to reflect on their competencies and skills in the world of work. Direct informal feedback can also be given to lecturers. Students can also address potential issues through their "class delegates". Formal structures for student representation and for student-to-student support are available at the university and faculty.

Further, UB has developed appropriate procedures and tools contributing to the overall quality (enhancement) of its study programmes. This includes a procedure for complaints and for suggestions as well as tools to combat plagiarism, prevent discrimination and promote good ethics. These instruments were discussed during the site visit with the panel of experts and are generally well developed and fit for purpose. The experts would however like to suggest, that the faculty's own complaints system on the "Halo Filkom" platform be anonymised in the future, to allow for broader participation of the students (**Finding 14**).

Other tools that contribute to good study conditions and to the overall quality are student appeals and regulations as standardised in the overall Academic Handbook. The procedure for student appeals is documented and generally accessible to students. Even though attendance is required to most lectures and sessions, there are some exemptions based on e.g. illness. These regulations are conducive to a good learning environment.

Conclusion

The criterion is fulfilled.

3. Learning, teaching and assessment of students

Bachelor/Master degree

The delivery of material encourages students to take an active role in the learning process.

Students are assessed using accessible criteria, regulations, and procedures, which are made readily available to all participants and which are applied consistently.

Assessment procedures are designed to measure the achievement of the intended learning outcomes.

[ESG 1.3]

Description

According to information in the self-evaluation report the curricula follow Outcome-Based Education (OBE) standards in compliance with national regulations. UB states that this approach is considered when designing the curricula as well as setting the learning objectives and achievements, education strategies, learning methods, assessment procedures and the education environment. UB also states that its goal is to engage students to be active in the learning process. Student-centred learning should lead to an increase in the students' willingness and ability to seek, obtain and process information and skills related to science and technology. As examples of student-centred methods UB mentions discussions, problem-based learning, and project-based learning. Additionally, the university has developed a blended learning model using its learning platform (including video material) as well as a flipped classroom approach and hybrid classrooms. The 5 learning and teaching methods used in the programmes are: lecture and discussion, hands-on laboratory work, field work (including internships and community service), independent learning, and research/problem-solving project.

UB states that research is interlinked with teaching and learning through the work of the lecturers but also through the involvement of students in research activities. The programme leaders state that in the Master's programme an emphasis is put on student research-oriented learning. Students should join one of the faculty's research groups in their first semester. According to information in the self-evaluation report student participation in the lecturers' community service activities is also encouraged. Students can also take part in additional practical activities in the framework of the Freedom to Learn national policy at Bachelor level.

Assessments take the form of structured activities, quizzes, midsemester exams, final exams. Students receive an exam schedule at the beginning of the semester. According to the OBE implementation guidelines, programme leaders develop assessment rubrics for the exams. Students can re-take courses in order to improve their grades.

Experts' evaluation

The overall impression gained during the site visit was that all 6 programmes are organised and conducted in a very student-focused manner. The teaching staff looks after and advises the students intently and well. Teaching methods include good combinations of lectures, laboratory sessions and project-oriented tasks. The number of students in one lecture is limited to 35-40 students. Especially the RPS (Semester Teaching Plan/Semester Lesson Plan) provide a very detailed documentation for each course.

According to national rules, UB calculates credits in SKS with 1 SKS amounting to a weekly workload of 170 minutes or a total workload of 45 hours (in a semester of 16 weeks). European standards plan with a maximum total workload of 30 hours per ECTS and 30 ECTS per semester amounting to a workload of 900 hours per

semester. At UB good students may take up to 24 SKS per semester which result in total workload of 1080 hours for one semester. The exact amount of SKS that can be taken in one semester depends on the student's Grade Point Average (GPA).

From a European point of view the workload seems to be quite high. During the site visit students as well as teaching staff confirmed that it is feasible to finish the study programmes on time. Nevertheless, the charts provided show that the average study period of graduates is above the regular time for all study programmes except BPIT. According to the faculty management, the main reason is that the students take more time to finish their thesis. Since the material provided and the support given for writing a thesis seem to be very good and since the deviation from the regular study time lies mostly within one year, the experts refrain from formulating a recommendation at this point. The topic should however be reconsidered in the course of the next reaccreditation.

The learning process for each course is described in detail in the RPS. This documentation includes a lesson plan matrix which describes learning outcomes, study material, learning methods and evaluation for each week of the semester. Based on the exemplary documents provided to the experts it can be concluded that the learning and teaching methods are very systematically matched to the goals of the study programmes as well as to the learning outcomes of the courses. During the site visit students as well as teaching staff described how individual communication supports the students' individual learning process.

The transfer of knowledge to situations outside the university context is not only supported by internships which UB supports, but also by the national programme of independent learning (MBKM) (see also Chapters 4 and 6).

The assessment regulations and procedures are defined in the RPS which are available to the students on the website of UB. In addition, the RPS is presented and discussed in the first session of each course. Assessment takes place during the semester, mid-term and final examination only account for a part of the overall grade. Other elements of the assessment take the form of worksheets, group presentations or discussion reports. This detailed planning of learning and evaluation allows a precise matching of intended learning outcomes and assessment.

The grades are entered into the learning system (SIAM for students and SIADO for teaching staff) continuously during the whole semester so that students know very early if they may not pass the course. This way, they have the chance to react early and prevent failure. The intermediate semester may be used to retake exams.

While the overall impression on the criterion of learning, teaching and assessment is a very good one, the documentation has room for improvement. In the view of the experts there are too many documents addressing the same or similar topics but differing in nomenclature, structure, and layout. This makes it hard to gain an overview and to fairly evaluate the criterion. With regard to learning, teaching and assessment the following documents seem to be relevant:

1. Curriculum Book
2. Course descriptions provided in several annexes
3. RPS – for which only a few were provided in English.

The course portfolio (example in English language was provided for CIE60027) seems to be a good source of information for the continuous improvement of teaching and assessment methods.

The experts therefore recommend that the faculty provides a consolidated set of documents using identical nomenclature and structure for each study programme. The experts further recommend that the course descriptions include a high level of information on the assessment. Currently, this information can only be found

in detail in the RPS. The faculty may consider integrating different documents into one (e.g. Curriculum Book and course descriptions) (**Finding 15**, see also Chapter 6).

Conclusion

The criterion is fulfilled.

4. Student admission, progression, recognition and certification

Bachelor/Master degree
Consistently applied, pre-defined, and published regulations are in place which cover student admission, progression, recognition, and certification.
[ESG 1.4]

Description

The overall academic rules and procedures are defined in UB's education guidelines also called Academic Handbook. It regulates every aspect of the programmes, e.g. credits, procedures, complaints, exams, admission and transfer requirements, role of the academic advisor.

Admission in the programmes is possible through 1) the national selection scheme based on academic achievements, report grades and other achievements, 2) the national selection scheme based on a computer-based test/skill examination, or 3) the independent selection scheme managed by UB directly, either a test- or a report-based selection. A general requirement for the Bachelor's programmes is to have completed secondary education in a science major. Additionally, UB states that applicants for the Bachelor's programme "Computer Engineering" cannot be colour blind. Applicants to the Master's programme must fulfil the following requirements: have graduated from undergraduate programmes with various scientific backgrounds with a minimum GPA of 2.75, have a valid ITP-TOEFL certificate (minimum score of 450) or equivalent, have a TPA (Academic potential test) certificate (minimum score of 450), submit a research plan or synopsis for the master's thesis, submit scientific papers that have been published if any, submit two recommendation letters, and pass the entrance examination test and interview.

Each semester students can take a maximum of 24 credits depending on the GPA they achieved in the previous semester. Academic advisors should support students in the planning of their studies and should check their progression, among others by using the data available on the academic information system platform of UB. The apps developed by the faculty should also support in monitoring and accompanying the students during their thesis phase.

In the framework of the national scheme Freedom to Learn/Independent Campus (MBKM) students can study outside their study programme either at another faculty or take part in non-lecture activities outside the study programme, e.g. student exchanges, internships or work practices, research, humanitarian projects, entrepreneurial activities. These activities are then recognised in their own study programme based on equivalency and recognition procedures defined by the faculty. UB states that a number of foreign students have already taken part in the study programmes under review.

Upon completion of their studies students receive their diploma, transcripts, and a Diploma Supplement according to the national template. According to information in the self-evaluation report UB supports students in gaining professional certification from industry programmes and trainings.

Experts' evaluation

The formal requirements for admission are well-defined and based on governmental requirements. Application information can be found online by prospective students. Departments manage the admission procedures and follow the students' study progress permanently, supported by software.

The Computer Science study programmes are very student centric. The application process is monitored as well as the study progress of the students. A large team of lecturers guarantee the successful graduation of their students. Since UB has a high ranking among Indonesian universities, the application rate for Computer Science programmes is quite high and only the best 10 % are accepted. Yet, there are still students failing courses, for example because of financial and family difficulties or due to mental health problems. UB offers its own staff to support these students.

International exchange programmes are established. Most of the incoming students come from Asia and Australia. For them the tuition fee is quite high since international students are not supported by the Indonesia government scholarships like the locals. Both incoming and outgoing students are supported by an International Office of the university during their application. Courses are documented and credited to the students by well-defined documents (Learning Agreement and Recognition) and regulations (Academic Guidelines/Handbook). Students can also benefit from the Independent Campus scheme and take an internship or other classes at other universities in Indonesia. The recognition process works well. Since the number of outgoing students remain low, the experts recommend the university fosters the academic mobility of students even more (**Finding 2**).

Collaboration with international research institutes or companies is very much supported by the university. For education, there are 3-in-1 courses implemented in the Computer Science programmes where a local lecturer, an international teaching staff and a lecturer from a company provide a course together. This is very much appreciated by the students.

The graduates receive their degree accompanied by a certificate, including all the necessary information on the study programme and its courses.

Conclusion

The criterion is fulfilled.

5. Teaching staff

Bachelor/Master degree

The composition (quantity, qualifications, professional and international experience, etc.) of the staff is appropriate for the achievement of the intended learning outcomes.

Staff involved with teaching is qualified and competent to do so.

Transparent procedures are in place for the recruitment and development of staff.

[ESG 1.5]

Description

Teaching staff at UB can be recruited as civil servants or on a contract basis. According to national guidelines the minimum qualification to teach in a Bachelor's programme is to hold a Master's degree, for teaching in a Master's programme lecturers most hold a Doctorate. Staff recruitment at UB is based on a basic ability test as well as a skill ability test. Based on national guidelines, the lecturers' workload covers 12 to 16 credits (SKS) per semester; this includes teaching, research, and community service activities. Staff evaluation is carried out

in the framework of the quality assurance mechanisms, it includes an evaluation of teaching staff workload and of performance goals.

For the Bachelor's programme "Informatics Engineering" there is a total of 71 teaching staff, including 1 professor, 6 associate professors, 58 assistant professors and 6 lecturers. For the Bachelor's programme "Computer Engineering" there is a total of 45 teaching staff, including 3 associate professors, 38 assistant professors and 4 lecturers. For the Bachelor's programme "Information Systems" there is a total of 18 teaching staff, including 15 assistant professors and 3 lecturers. For the Bachelor's programme "Information Technology Education" there is a total of 14 teaching staff, including 13 assistant professors and 1 lecturer. For the Bachelor's programme "Information Technology" there is a total of 23 teaching staff, including 23 assistant professors and 2 lecturers. For the Master's programme "Computer Science" there is a total of 11 teaching staff, including 1 associate professor, 9 assistant professors and 1 lecturer.

UB indicates that there is also 2-3 part-time teaching staff in each Bachelor's programme. Especially for the Master's programme guest lecturers (e.g. from Japan) and industry practitioners are also invited to take part in the teaching process. At the faculty there is 63 supporting staff (librarians, laboratory assistants, programmes, and technicians, administrative personal as well as counselling staff).

Lecturers have access to the national training programme Basic Instructional Skill Development Training (PEKERTI) as well as Applied Approach (AA); these programmes should support lecturers in developing their skills in teaching methodologies and assessment methods. There are also offers to support the lecturers' development of innovative learning content, learning videos as well as teaching grants to support the implementation of participatory and project-based classes and scientific journal writing grants. According to information in the self-evaluation report staff is encouraged to pursue their studies, nationally and abroad, e.g. with a PhD, and to obtain professional certifications provided by the relevant industry bodies/companies.

Experts' evaluation

In the SER and during the online visit, the hiring options for teaching staff have been presented and discussed. The amount of teaching staff is adequate and the lecturer to student ratio corresponds to the required national framework. Most teaching staff is currently employed at the level of assistant professor. Their qualifications fit the needs of the study programmes. The offered training programmes to further qualify teaching staff are very positive. The overall workload of teaching staff is to be understood in the Indonesian context – it is deemed suitable by the panel of experts.

UB's strategic goal is to become an internationally visible research institution. To work towards that goal, it is necessary to increase the qualification of the teaching staff and bring more faculty to the level of associate and full professor. Furthermore, to become a visible research university, a successful Master's programme with English-taught courses and, prospectively, a PhD programme should be considered. Teaching staff at the levels of associate and full professor is also required to teach in such Master's and PhD programmes. The experts therefore recommend that the university

- provides additional incentives and support mechanisms, e.g., a teaching load reduction system, to increase the research activities of the teaching staff (**Finding 16**) and
- fosters academic mobility of lecturers (as well as of students) (**Finding 2**).

Conclusion

The criterion is fulfilled.

6. Learning resources and student support

Bachelor/Master degree

Appropriate facilities and resources are available for learning and teaching activities.

Guidance and support is available for students which includes advice on achieving a successful completion of their studies.

[ESG 1.6]

Description

For each course students receive a Semester Lesson Plan, also called Semester Teaching Plan or RPS, detailing the programme learning outcomes, the course learning outcomes, the learning frequency, duration of learning, course types, duration of face-to-face learning, duration of independent study, number of students, prerequisites for attending lectures, course objectives, learning methods, assessment methods, the person in charge of the course. According to information in the self-evaluation report the RPS are checked and adapted every semester – yearly in case of the Master's programme. Students also have access to a course handbook with further information on the make-up of the entire curriculum. Overall academic regulations are published in the university's Academic Handbook. Additional material is made available on the university online platform including teaching material and teaching media, e.g. videos, presentation files. UB states that the university online platform serves as a central access point for teaching and learning for both students and lecturers, for research and community service, as well as for academic information systems, services and online reporting.

The faculty organises orientation programmes for new students, introducing them to the study programmes and services offered at UB and at the faculty. Students have access to UB's Central Library as well as to the reading room managed by the faculty directly. UB's Central Library consists of over 74,000 titles and close to 220,000 copies as well as e-resources. University-wide central facilities include health facilities, sport facilities, banking infrastructure, worship spaces. The faculty is spread over 12 building, it has 35 classrooms as well as additional rooms for seminars, student research, student activities, and a consultation room. There is a total of 8 research laboratories (Information-Based Network, Media, Game, and Mobile, Robotics and Embedded Systems, Software Engineering, Intelligent Systems, Information Systems, Learning Technology, Learning Laboratory) and 5 learning laboratory rooms at the faculty. In addition, there is a room set up using MASH Classroom technology to allow for hybrid teaching and learning. According to information in the self-evaluation report students are provided with software licences.

Guidance and support are provided mainly by the academic advisor assigned to the students at the beginning of their studies as well as through the counselling units at university and at faculty level. Centrally there is also the Center of Career Development and Entrepreneurship, the Brawijaya Language Center (BLC), the Center for Personality Courses and Development (PMPK). Regarding students with special needs, UB mentions a Disability Services Study Center (PSLD) providing academic services for students with disabilities at UB as well as additional counselling provided by the faculty. Examples of support include assistance during the lectures, book digitisation, video captioning, and accessible document creation service. UB provides scholarships and information on external scholarships available to the students.

UB states in its self-evaluation report that there is a Student Executive Council and a Student Representative Council at UB as well as at faculty level for formal procedures and matters, as well as student associations at the level of the faculties and for the different subjects.

Experts' evaluation

In general, the Computer Science Faculty has well-managed learning resources. All students can easily access those resources. Student support is also well provided by the management of the university, the faculty,

and the lecturers. The learning rooms, learning laboratories and research laboratories have excellent and up-to-date facilities. The support staff are professionally qualified to support the process of practical learning in laboratories.

To support teaching and learning activities, UB and FILKOM also provide an integrated information system for all stakeholders. Students can access all academic activities through this platform – specific sections are reserved for students of UB or FILKOM. Besides the website there is a curriculum guidebook provided by the faculty. This guidebook includes all courses that students must take each semester and how they can be taken by students. However, there is limited information in this guidebook regarding intended learning outcomes, methods of learning and teaching, form of assessment. This is made available in other documents such as the Semester Lesson Plans. Here, and as mentioned previously, the experts therefore recommend that the faculty provides a consolidated reference document for each study programme including the "curriculum document"/handbook and all course descriptions/semester learning plans in one format. While doing this, the documents should be all checked for discrepancies and inconsistencies (**Finding 15**, see also Chapter 3).

The leadership of the Computer Science programmes has managed student support in a good way. Academic guidance as part of student support is available for students, they can consult their advisors on academic or non-academic issues in order to achieve the intended learning outcomes. Students can access advisory services in two ways, academic advisory through their academic advisor and counselling services through the Computer Science Faculty counselling advisory unit. The first service is under the responsibility of the lecturers who are assigned by the study programme management. Each student is provided with one academic advisor to assist them in planning their studies and providing recommendations. Students meet their academic advisors at the beginning of the semester to arrange their studies for the following semester. As a guide in assisting students, the Computer Science management provides a progression manual book for academic advisors. The academic advisor can also deal with non-academic issues. The second, the counselling services by the Counselling Unit aim at monitoring whether there are Computer Science students who have learning difficulties that cause their learning outcomes to be lacking during the learning process at UB. Students who have learning difficulties are categorised as 'critical students'. The Counselling Unit is part of the Student Affairs Section of the Computer Science Faculty at UB. Implementation time is carried out as long as students are active students. The students can also receive support related to personal, social, study, and career aspects. Training (e.g. motivation to complete studies, how to increase emotional intelligence, and so on) is offered in order to develop their personal competencies, their careers, their study, as well as social skills and social involvement. Students can see the schedule and consultation procedures through at dedicated webpage of UB.

The introductory offers for new students are available by following freshman orientation programmes in which intra- and extra-curricular topics and activities are introduced. Full information regarding the requirements of students' admission in Computer Science is provided to potential students on the university's website.

Students have the opportunity to take some courses in other universities, either nationally or internationally through the Independent Campus (MBKM) scheme. Student exchange activities are offered to students and are managed through this programme. This activity is divided into two types of activities: 1) Short course (1 week to 2 months) which can be recognised as a lecture activity of 3-6 credits, and 2) Full course (1 semester) which can be recognised as a lecture activity of 20 credits. Students are provided with a manual book of independent learning which can be downloaded from UB's website. Students are also provided with a manual book as a guide to do an internship (available on the website).

According to the curriculum guidebook, there are 6 curriculum paths that can be chosen by the students. Those 6 curriculum paths have a course offer which must be completed by students starting in semester 1 until semester 8. The structure of the curriculum in the 6 paths is the same in semesters 1 to 4. The difference of the structure occurs later. Students should decide on the path to be taken in their third year of study. The

approval of the academic supervisor is needed for the chosen curriculum path and after informing the head of the study programme. When students have decided the curriculum path to be taken, they are not allowed to change or switch to another path during their studies.

Both the infrastructure and the learning process at UB are well prepared to deal with student diversity. This is impressive in the view of the experts. Student diversity is well considered by the management of the Computer Science programmes. The management provides some technical support for disabled student to access learning resources – this was confirmed during the digital site visit.

The Computer Science Faculty provides 5 computer workplaces which are divided by learning course. The workplaces are equipped by modern facilities such as updated computer, internet, networking, and multimedia room. The 5 computer workplaces are used as learning laboratories for students. Beside those workplaces, there are 8 research laboratories for lecturers in different fields of subjects. All of these laboratories have well-equipped and up-to-date facilities. These laboratories support research in accordance with the scientific fields of all study programmes in Computer Science. The technical equipment is modern and appropriate for the national/international learning standards. Further, the faculty has an administration office room where all matters related to student administration is handled. In general, based on video information presented during the site visit the laboratories are equipped with excellent learning devices such as multimedia computer, LCD projector, electric whiteboard and smart TV. The technical support staff for laboratories are required to hold a Bachelor's degree in related fields and they are distributed as laboratory assistant, programmer, and technician. Regarding the professional development of these support staff, UB provides some training in the related field and opportunities to pursue a higher degree. In the view of the experts, the laboratories are generally appropriate for the achievement of intended learning outcomes. Laboratory facilities are continuously improved, practicum modules are continuously updated, and laboratory equipment in the form of computers, robots, mobile equipment, computer network devices, and software is also continuously equipped to support lecturers, students' practicum, and research. And the support staff also have professional adequacy to do their job in laboratories.

The total size of the facilities fits with the size of the student body. There are 35 classrooms with a total of 2123.51 m². The Computer Science Faculty has over 3,800 active students. Based on the staff description regarding the use of rooms, the facilities accommodate students learning. The library of the Computer Science Faculty has a collection of national and international books and has access to reputable international literature and journals. Students can access these resources for free using the UB integrated network. The following lists describe some of the literature that can be accessed online 24/7: Emerald Journal, Proquest, ScienceDirect, JSTOR, CNKI, Scopus, IEEE, InfoTrac, EBSCOHOST, ASM, Wiley Ebook, Springer, IG Publishing, Ebrary, UB Library OPAC, UB Repository, and Indonesian Repository.

The Computer Science management has good mechanisms in allocating funds from several financial resources. The appropriate material resources of UB are funded through tuition fees, the national state budget or Government, state university operational funding support. The financial system at the Computer Science Faculty is managed by faculty management, so that the study programmes can focus on managing students and curricula. The funding mechanism for study programmes is carried out proportionally based on student parents' financial condition to give equal opportunity for all students. UB has a Business Management Agency (BMA) as the parent of all business entities owned by UB. UB provides various types of scholarships for outstanding students, students with disabilities, and underprivileged students from government agencies and non-government institutions. Management, registration, and selection of UB scholarships are held online and offline by the Student Affairs Section at the university and faculty level. The information for scholarships at the university level can be found online on both university and faculty websites.

Conclusion

The criterion is fulfilled.

7. Information

Bachelor/Master degree
Impartial and objective, up-to-date information regarding the programme and its qualifications is published regularly. This published information is appropriate for and available to relevant stakeholders.
[ESG 1.8]

Description

The website of UB provides overall information on its study programmes and study conditions as well as services to students. Each study programme has a specific webpage linked to the site of the faculty. This includes information on the study programme profiles, the academic regulations at the faculty, the intended learning outcomes, academic systems, research activities and community service, student organisations, scholarships, job vacancies, quality assurance systems, agendas and contact persons. UB indicates in its SER that information is also provided to prospective students, current students, alumni and the wider community through various social media channels. At the faculty there is a specific unit, PSIK, in charge of informing stakeholders and update the published information.

Experts' evaluation

In the view of the experts, UB has a well-managed website as a publication tool to provide all information about activities at UB. The website is user-friendly, and all different stakeholders can easily access information from the website. The information is always updated regularly and objectively.

The website of the Computer Science Faculty provides all information about academic aspects needed by the stakeholders. In order to facilitate stakeholders' access to all services, UB provides GAPURA, an integrated service information system portal that provides easy access to information and services for all users at UB. The 6 study programmes of the Faculty of Computer Science have communicated and updated information regularly in their academic manuals and on their website pages. The Computer Science Faculty has a special unit to ensure the success of the update process and information dissemination, namely PSIK.

Conclusion

The criterion is fulfilled.

V. Recommendation of the panel of experts

The panel of experts recommends accrediting the study programmes "**Informatics Engineering**" (Bachelor of Computer Science), "**Computer Engineering**" (Bachelor of Engineering), and "**Information Technology Education**" (Bachelor of Education) offered by Universitas Brawijaya without conditions.

The panel of experts recommends accrediting the study programmes "**Information Systems**" (Bachelor of Computer Science), "**Information Technology**" (Bachelor of Computer Science), and "**Computer Science**" (Master of Computer Science) offered by Universitas Brawijaya with conditions.

Findings:

All programmes:

1. The university should facilitate the switch from one Bachelor's programme to another Bachelor's programme for the students, based on a simple recognition procedure.
2. The university should foster the academic mobility of students and lecturers and strengthen its internationalisation efforts to attract international students from western countries.
3. In order to support international mobility the university should summarise the different courses leading to the final thesis into one overarching/meta-module showing the total number of credits allocated to these activities. This is especially important for MPCS.

BPCE:

4. The credits for the compulsory mathematics education in BPCE should be increased from currently 14 ECTS to at least 20 ECTS in order to support international student mobility including after completing their studies.

BPIS:

5. The university must provide an integrated set of documentation for the BPIS course syllabus that describes the contents of the courses including the learning outcomes and methods of assessment. These descriptions must use the same structure and nomenclature, be complete and must not contain any discrepancies.
6. It is recommended that the literature lists in the BPIS Curriculum Book be updated.

BPITE:

7. The BPITE intended learning outcomes should explicitly include an attitude aspect which relates to professional teachers.
8. The university should provide full information on the profile of the BPITE graduates and the sectors in which they are employed following graduation (schools, education/training, industry).

BPIT:

9. The university must demonstrate how BPIT trains students at the Bachelor level according to the National Qualifications Framework (KKNI) and the European Qualifications Framework (EQF). The differences with a vocational Diploma programme in Information Technology must be made clear. Changes to the programme and course learning outcomes and/or curriculum of BPIT might be required to reach a qualification at EQF level 6.

MPCS:

10. The structure of the MPCS curriculum and the different number of credits for each course and course category must be checked and depicted consistently in all the study programme documents.
11. The workload and number of credits of the MPCS thesis should be increased.

All programmes:

12. The course evaluation questionnaire should be less lecturer-centred and more course- and student-centred and address issues such as workload in more details.
13. The university should find ways to inform students of the results of the evaluation and on the actions taken because of the feedback given by students.
14. The faculty should anonymise the complaints system on the “Halo Filkom” platform.
15. The faculty should provide for each study programme a consolidated set of documents using identical nomenclature and structure. The course descriptions should include high level information on the assessment.
16. The university should provide additional incentives and support mechanisms, e.g. a teaching load reduction system, to increase the research activities of the teaching staff.