AQAS

AGENTUR FÜR
QUALITÄTSSICHERUNG DURCH
AKKREDITIERUNG VON
STUDIENGÄNGEN E.V.

FINAL REPORT

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY

CLUSTER ELECTRICAL – ELECTRONICS ENGINEERING

ELECTRICAL ENGINEERING (BACHELOR OF ENGINEERING)

CONTROL ENGINEERING AND AUTOMATION (BACHELOR OF ENGINEERING)

ELECTRONICS – TELECOMMUNICATIONS ENGINEERING (BACHELOR OF ENGINEERING)

ELECTRICAL – ELECTRONICS ENGINEERING (BACHELOR OF ENGINEERING, ADVANCED PROGRAMME)

January 2024

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Content

DECISION OF THE AQAS STANDING COMMISSION

ON THE STUDY PROGRAMMES

▪ **"ELECTRICAL ENGINEERING" (BACHELOR OF ENGINEERING)**

▪ **"CONTROL ENGINEERING AND AUTOMATION" (BACHELOR OF ENGINEERING)**

▪ **"ELECTRONICS – TELECOMMUNICATIONS ENGINEERING" (BACHELOR OF ENGINEERING)**

▪ **"ELECTRICAL – ELECTRONICS ENGINEERING" (BACHELOR OF ENGINEERING, ADVANCED PROGRAMME)**

OFFERED BY HO CHI MINH UNIVERSITY OF TECHNOLOGY, HO CHI MINH CITY, VIETNAM

Based on the report of the expert panel, the comments by the university, the discussions of the AQAS Standing Commission in its 19th meeting on 04 December 2023, and the circulation procedure of 15 January 2024, the AQAS Standing Commission decides:

1. The study programme **"Electrical – Electronics Engineering" (Bachelor of Engineering, Advanced Programme)** offered by **Ho Chi Minh University City of Technology, Vietnam** is accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master).

   The study programme complies 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 **"Electrical Engineering" (Bachelor of Engineering)**, **"Control Engineering and Automation" (Bachelor of Engineering)**, and **"Electronics – Telecommunications Engineering" (Bachelor of Engineering)** offered by **Ho Chi Minh University City of Technology, Vietnam** 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 January 2025**. 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 January 2030**.

Conditions:

For the study programmes "Electrical Engineering" (Bachelor of Engineering), "Control Engineering and Automation" (Bachelor of Engineering), and "Electronics – Telecommunications Engineering" (Bachelor of Engineering):

1. The module descriptions in the module handbook must be revised to be more detailed and explain the methods and learning outcomes more specifically to clearly indicate the differentiation from other study programmes.

2. The academic guidelines for the final theses regarding references and formatting must be revised in order to enhance the quality of the thesis following the international standards.

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

For all study programmes:

1. In order to get a more complete picture of the course evaluation of all study programmes, participation rates and coverage should be increased during the QA process.

2. In order to ensure the student-centred learning environment, the university is recommended to:

    a. study how to inspire and encourage students to be more active and independent in their learning.

    b. design the class size more effectively to engage students to learn in a more interactive and personalised way.

3. For all study programmes, the regulations for resitting exams should be more transparently documented to facilitate students during their learning progress.

4. The university should have other supportive schemes to balance the workload for the teaching staff to make sure the teaching staff will not feel overwhelmed and can maintain the good quality of work.

5. The university should develop a distinct strategy for the laboratory equipment concerning the actual need of the programmes and equipment, and the decision for specific state-of-the-art and industry-standard tools should be decided based on both industrial availability and the actual requirements of study programmes for the education purpose.

6. In order to foster the diversity approach at HCMUT, the following aspects should be implemented by the university:

    a. The supporting procedures for students with special needs should be revised and documented more transparently to accommodate more diverse special needs of students.

    b. A plan to attract more female students to study in engineering should be developed.

7. More information and details on the study programmes should be made accessible to the external stakeholders such as industries, prospective students, and their parents.

Additionally for the study programmes "Electrical Engineering" (Bachelor of Engineering), "Control Engineering and Automation" (Bachelor of Engineering), and "Electronics – Telecommunications Engineering" (Bachelor of Engineering):

8. In order to improve the academic writing skills, students should be offered the fundamental writing course as the advanced programme offered at HCMUT.

9. Soft skills such as independent work and critical thinking capacity should be incorporated into the curriculum.

Additionally for the study programme "Electrical Engineering" (Bachelor of Engineering):

10. The curriculum development should adapt with new technology tools to keep updated with the international trends on technology development.

Additionally for the study programme "Electronics – Telecommunications Engineering" (Bachelor of Engineering):

11. The content of courses should be reviewed and updated in the module handbook in terms of topics and literatures.

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

EXPERTS' REPORT

ON THE STUDY PROGRAMMES

- **"ELECTRICAL ENGINEERING" (BACHELOR OF ENGINEERING)**

- **"CONTROL ENGINEERING AND AUTOMATION" (BACHELOR OF ENGINEERING)**

- **"ELECTRONICS – TELECOMMUNICATIONS ENGINEERING" (BACHELOR OF ENGINEERING)**

- **"ELECTRICAL – ELECTRONICS ENGINEERING" (BACHELOR OF ENGINEERING, ADVANCED PROGRAMME)**

OFFERED BY HO CHI MINH UNIVERSITY OF TECHNOLOGY, HO CHI MINH CITY, VIETNAM

Visit to the university: 31 July – 02 August 2023

Panel of experts:

Prof. Dr. -Ing. Volker Lücken   University of Applied Sciences Trier, Professor of Industrial Automation and Communication Technology (Germany)

Prof. Dr. Tony Q.S. Quek   Singapore University of Technology and Design, Director of Future Communications R&D Programme (Singapore)

Prof. Dr.-Ing. Kirsten Weide-Zaage   Leibniz University of Hannover, Faculty of Electrical Engineering and Computer Science (Germany)

Lien Vo   Intel Corporation, Vietnam Talent Planning & Acquisition Manager (Vietnam) (representative of the labour market)

Dominik Kubon   Student of RWTH Aachen, Electrical Engineering, Information Technology and Computer Engineering (Germany) (student expert)

Coordinator:
Vi Le

Ronny Heintze   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 universities, universities of applied sciences and academic associations. Since 2002, the agency has been recognised by the German Accreditation Council (GAC). It is, therefore, a notified body for the 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 academic studies and higher education institutions' teaching. In line with AQAS' mission statement, the official bodies in Germany and Europe (GAC and EQAR) approved that the activities of AQAS in accreditation are neither limited to specific academic disciplines or degrees nor a particular type of higher education institution.

II.   Accreditation procedure

This report results from the external review of the Bachelor's programmes **"Electrical Engineering" (Bachelor of Engineering)**, **"Control Engineering and Automation" (Bachelor of Engineering)**, **"Electronics – Telecommunications Engineering" (Bachelor of Engineering)**, and **"Electrical – Electronics Engineering" (Bachelor of Engineering, Advanced Programme)** offered by **Ho Chi Minh City University of Technology, Vietnam**.

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 September 2022. The university produced a Self-Evaluation Report (SER). In December 2022, 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 27 February 2023. The final version of the SER was handed in May 2023.

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 2023. 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 site visit to the university took place on 31 July – 02 August 2023. On site, 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 Standing Commission was informed about the procedure in its meeting on 04 December 2023. 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 in a circulation procedure on 15 January 2024. AQAS forwarded the decision to the university. The university had the right to appeal against the decision or any of the imposed conditions. AQAS forwarded the decision to the university. The university had the right to appeal against the decision or any of the imposed conditions.

In February 2024, 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

Ho Chi Minh City University of Technology (HCMUT) was founded in 1957 and is part of Vietnam National University – Ho Chi Minh City (VNU-HCM), a national multidisciplinary consortium of six universities, one research institute and several affiliate centres and institutions. HCMUT is spread across two campuses and is structured into eleven faculties, 63 departments, 4 training centres, 14 supportive offices, and 9 research and technology transfer centres. According to the report, the university has an annual student body of about 20.000 students and 1.300 full-time staff members. The goals of the university stated in the SER include the achievement of an international standard in engineering education, to enhance intellectual growth, and to assert a role as a leading university of training and scientific research in Vietnam. According to the strategic objectives 2021-2025, the university strives to achieve (1) effective governance in the context of university autonomy; (2) higher education internalisation; (3) internationally qualified human resources; (4) excellence in science, technology, and innovation; (5) exceptional facilities and infrastructure; and (6) social responsibilities and community services.

HCMUT receives funding from three major sources: (1) governmental funding, both permanent and temporary, to be used for salaries and the maintenance of facilities; (2) tuition fees, research projects, and technology transfers; and (3) sponsorships from local or international organisations.

The Faculty of Electrical and Electronical Engineering (FEEE) consists of seven departments and seven workshops/labs which are responsible for four undergraduate programmes including Electrical Engineering, Control Engineering and Automation, Electronics – Telecommunications Engineering, and Electrical – Electronics Engineering. These four study programmes are to be accredited. The faculty admits annually about 900 full-time undergraduate students and as of December 2022, the faculty' student population is approximately 4900 students, including both undergraduates and postgraduates.

IV. Assessment of the study programmes

1. Quality of the curriculum

> **Bachelor's/Master's 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]*

General information of the Bachelor's programmes "Electrical Engineering", "Control Engineering and Automation", and "Electronics – Telecommunications Engineering"

The curricula of the three programmes are structured into three categories: (1) general topics offered independently of the study programme, including a block on "Mathematics and Basic Sciences", a block of four subsequent English classes, military training and physical education, and a block on "Socials and Economics"; (2) subject-specific courses, which are divided into core and major courses, and (3) a cluster of practical courses and graduation projects.

As stated in the SER, the curricula of the programmes are designed according to a top-down approach. This means that the design and revision of a programme starts with the definition of the required programme

objectives (POs) in accordance with the university' visions and missions and the Vietnamese Quality Framework (VQF)'s regulations. The study programmes of FEEE share four programme objectives including:

1. Practice profession in electrical engineering, lead inter-disciplinary engineering teams to design and implement components, systems and process in the field of electrical engineering;
2. Pursue advanced education, research and development; self-study in professional activities to adapt to rapidly changing global economic-technical environment;
3. Demonstrate responsible, professional, and ethical behaviours for the sustainable development of the society;
4. Work effectively and develop profession in global environment.

These programme objectives are then translated seven into intended learning outcomes (ILOs) listed as follows:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
3. An ability to communicate effectively with a range of audiences;
4. An ability to recognise ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts;
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. An ability to develop and conduct appropriate experimentation, analyse, and interpret data, and use engineering judgment to draw conclusions;
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The university states that both POs and curricula are periodically reviewed and updated and to involve input from all relevant stakeholders, i.e. lecturers, students, alumni, and employers. The most recent revision of three curricula were in 2019 which have mainly focused on the adjustment of the number of credits required for graduation in the undergraduate programmes, from 142 credits to 128 – 132 credits.

1.1 Electrical Engineering (Bachelor of Engineering)

Description

The curricular structure of the Electrical Engineering (EE) programme consists of 132 credits with a duration of eight semesters or four years. Beside the three blocks of courses mentioned above, the study programme offers core courses and specialty courses. The workload in each semester ranges from 15 to 18 credits. Core courses include Introduction to electrical and electronics engineering, Electric circuit analysis, Computer systems and programming languages, Digital designs, Microprocessor, Electronic circuits, Fundamentals of power engineering, Electromagnetic field, Fundamentals of control systems, Fundamentals of power electronics, Electrical safety engineering. Specialty courses listed in the curriculum are Power system analysis, Power delivery system, Electric power plants and substations, and Electric machinery.

In the semester 1, 2 and 3, students are required to take general courses such as Calculus 1 and 2, Probability and Statistics, Numerical Methods, General physics 1 and 2, General chemistry, Linear algebra, General physics labs, Physical education 1, 2 and 3, Introduction to electrical and electronics engineering, and Military

training. Also in semester 3, the study programme offers courses including Introduction to Vietnamese law, Electric circuit analysis, Computer systems and programming languages, and Digital designs. Courses in semester 4 consist of Microprocessor, Electronic Circuits, Fundamentals of Power Engineering, Electromagnetic Field, and Marxist and Leninist philosophy. In addition, students are required to take English courses in the first four semesters. Semester 5 offers courses such as Electrical Workshop 1, Electronic Workshop 1, Marxist – Leninist political economy, Fundamentals of control systems, Fundamentals of power electronics, Power system analysis, and one free elective course with 3 credits. Courses including Power delivery system, Electric power plants and substations, Electric machinery, Electric Workshop 2, Project 1, Internship, 1 elective in group A (in-depth specialty courses) and Scientific socialism are offered in semester 6. Students are to take courses like Electrical safety engineering, Project 2, History of Vietnamese Communist Party, one free elective with 3 credits and 2 electives in group A with 6 credits in semester 7. Humans and environment, Ho Chi Minh ideology, one free elective with 3 credits and 1 elective in group B (social and economics management courses) are courses offered in semester 8. Students are also required to conduct a Capstone project with 4 credits in semester 8.

For the EE program, graduates from this programme are specialised in power and energy systems for both industrial and civil applications. They would solve traditional problems such as power generation, transmission and distribution, power system protective coordination, power system operation and maintenance, as well as modern problems such as smart grid design, control and operation, power electronics and applications, renewable energies.

Experts' evaluation

The total programme workload is correctly and transparently allocated to the different courses/modules. The number of credits assigned to all elements of the curriculum is also correct. All curricular elements (courses/modules) including their functions, their compulsory/elective character and their usage/exclusiveness are well-documented, but the module descriptions in the module handbook must be revised to be more detailed and explain the methods and learning outcomes more specifically, as the current formulation does not indicate the differentiation from other study programmes **(Finding 1)**. In case there have been curricular modifications, they have contributed to an improvement of the programme quality, especially in terms of industry relevance through workshop training of teaching staff by industry and industry guest speakers. Overall, the curricular structure of the programme supports the achievement of the intended learning outcomes and the learner's progression. The desired qualifications to be achieved are presented as intended learning outcomes clearly. There is sufficient evidence of technical depth of the programme and the high quality of graduates that the programme produced. The curriculum shows evidence to cover subject-specific and cross-subject knowledge as well as subject-related, methodological, and general skills. For example, there are some courses that teach AI technologies such as machine-learning and artificial intelligence in automation, where students from all of the 4 programmes are free to choose. However, the curriculum should continue to adapt with new technology trends, for example, the use of chatbots in industry **(Finding 2)**. Currently, the university does not have any policy to allow or ban chatbots. The main reason may be that these tools are predominantly in English, but it is important for students to know such a tool.

The academic degree corresponds to the learning outcomes and the requirements of the appropriate level of the European Qualifications Framework level 6 and the respective national qualifications framework. The programme is rigorous and achieves the learning objectives that it lays out. The achievement is demonstrated upon the completion of the programme with a strong curriculum and very dedicated teaching staff. Yet, there are a few parts that need improvement to reach international standard. Firstly, the final theses will need a higher academic standard in the form of academic guideline, as there is a huge variance on the quality and academic standards regarding references and formatting **(Finding 3)**. During the site visit, the experts could identify the new elements as well as the great extent of knowledge presented in the theses. However, they

face some structural problems as well as improper citations and structure. Instead of letting students refer to the past years' theses as reference, the programme can set a higher quality benchmark for students to refer to and this can be done through introduction of the best thesis awards. Another suggested solution is to allow all students in this programme to take the fundamental writing course from the advanced programme offered at HCMUT **(Finding 4)**. This will improve the technical writing and standard of the thesis significantly. Additionally, soft skills such as independent work and critical thinking capacity should also be incorporated into the curriculum **(Finding 5)**. The university should consider creating a supportive and inclusive learning environment where students feel comfortable practicing and improving that prepares them for success in various personal, academic, and professional contexts. In this way, this will prepare students for competent international jobs in the market due to increasing investment by foreign companies in Vietnam.

The intended learning outcomes reflect timely both academic and labour market requirements. This is evident from the very positive feedback from the employers in the industry as well as university. The intended learning outcomes are updated according to current developments regularly. There are annual meetings with the industry when the programme lead makes changes to the curriculum. In addition, the programme also invites representatives of the industry and asks for input and comments. More importantly, industry representatives are also part of the thesis defence committee, which is a good feedback mechanism to assess whether the learning outcomes meet the labour market requirements. Furthermore, the interactions with the industry representatives are very positive and shows a very strong linkage between industry and the programme. For example, there are different levels for students to get direct exchange with the industry, e.g. in research when they have a topic in cooperation with the field, internships, and industry workshops.

Conclusion

The criterion is partially fulfilled.

1.2 <u>Control Engineering and Automation (Bachelor of Engineering)</u>

Description

The curricular structure of the Control Engineering and Automation (CEA) programme consists of 132 credits with a duration of eight semesters or four years. Beside the three blocks of courses mentioned above, the study programme offers core courses and specialty courses. The workload in each semester ranges from 15 to 18 credits. Core courses include Introduction to electrical and electronics engineering, Electric circuit analysis, Computer systems and programming languages, Digital designs, Microprocessor, Electronic circuits, Fundamentals of power engineering, Signals and system, Fundamentals of control systems, Fundamentals of power electronics, PC-based measurement and control, Industrial instrumentation, Advanced control theory, and Robotics. Specialty courses listed in the curriculum are Devices and automation systems.

In the semester 1, 2 and 3, students are required to take general courses such as Calculus 1 and 2, Probability and Statistics, Numerical Methods, General physics 1 and 2, General chemistry, Linear algebra, General physics labs, Physical education 1, 2 and 3, Introduction to electrical and electronics engineering, and Military training. Also in semester 3, the study programme offers courses including Introduction to Vietnamese law, Electric circuit analysis, Computer systems and programming languages, and Digital designs. Courses in semester 4 consist of Microprocessor, Electronic Circuits, Fundamentals of Power Engineering, Signals and Systems, and Marxist and Leninist philosophy. In addition, students are required to take English courses in the first four semesters. Semester 5 offers courses such as Electrical Workshop 1, Electronic Workshop 1, Marxist – Leninist political economy, Fundamentals of control systems, Fundamentals of power electronics, Devices and automation systems, and one free elective course with 3 credits. Courses including PC-based measurement and control, Industrial instrumentation, Advanced control theory, Electric Workshop 2, Project

1, Internship, 1 elective in group A (in-depth specialty courses) and Scientific socialism are offered in semester 6. Students are to take courses like Robotics, Project 2, History of Vietnamese Communist Party, one free elective with 3 credits and 2 electives in group A with 6 credits in semester 7. Humans and environment, Ho Chi Minh ideology, one free elective with 3 credits and 1 elective in group B (social and economics management courses) are courses offered in semester 8. Students are also required to conduct a Capstone project with 4 credits in semester 8.

For the CEA program, graduates from this programme are specialised in control and automation solutions for both industrial and civil applications. They would develop control systems with modern algorithms, high accuracy, and fast response. They can also develop automation systems for production lines, tool machines, integrating innovative technologies.

Experts' evaluation

The goal of the Control Engineering and Automation (CEA) programme is the education to high quality human resources with effective development in terms of science, technology, and economy. The students will be specialised in control and automation solutions for industrial and civil applications. They are able to develop control systems with modern algorithms, high accuracy, and fast response as well as automation systems for production lines and tool machines, integrating innovative technologies. A modern lab for robotic application development is provided. The intended learning outcomes of the curriculum which the students can achieve are completely and explicitly described and reflect both academic/scientific and labour market requirements. A project course and a capstone project/thesis are provided to train the student to independently work and apply their expertise to solve related and practical problems. The HCMUT has defined qualification goals for the programme that take into account both the technical aspects and the scientific ability as well as the personality development of the students the requirements of the appropriate level of the European Qualifications Framework level 6 is achieved. Curricular modifications for improvement of the programme quality are documented in the SER.

The programmes cover several project-centric courses and examinations. Internships to learn practical knowledge and skills evaluated by supervisors are provided. Part-time studying is also possible. This approach aligns with the requests from the local industry for student's individual work on technical topics. Current developments are updated by interaction with industrial demands as well as research. During the site visit, the experts observed the close relationship between the study programme and the industry in order to make any changes in the curriculum based on the industry needs. Although the experts view this constant interaction as positively when aligning with the market's needs, the independence of the study programme in developing the curriculum and making decision should also be ensured to achieve the actual educational purposes of the study programme **(Finding 6)**.

Evaluations and surveys on the curriculum were carried out and feedback from the stakeholders (employers, alumni, students, lecturers, and scientists) for the programme is also obtained. After completing the training programme, students shall have sufficient basic, specialised, interdisciplinary knowledge, and socio-economic management. The intended learning outcomes are revised in 2019 and mapped on the corresponding objectives with periodical review. Therefore, the desired qualifications to be achieved are subject-specific and interdisciplinary elements are included. However, as feedback from the labour market that soft skills of the students should be strengthened, courses on soft skills should be included in the curriculum **(see Finding 5)**.

From the learning outcomes, the course syllabus is appropriately designed for the programme objectives and consists of compulsory courses (in general, core, and specialised knowledge areas) and electives. The detailed curriculums as well as typical course plans were given. The syllabus is revised every semester, and the workload is also monitored.

Workload, credit points as well as detailed course descriptions are available. The national credit point system is converted into the ETCS and is compliant with the European standards. The total programme workload is correctly and transparently allocated to the different courses/modules and the number of credits is correct assigned. All curricular elements (courses/modules) including their functions, their compulsory or elective character and their usage/exclusiveness are documented, but the module descriptions in the module handbook must be revised to be more detailed and explain the methods and learning outcomes more specifically, as the current formulation does not indicate the differentiation from other study programmes **(see Finding 1)**.

A high variance in the quality of Bachelor's theses was found during the site visit. Although the knowledge presented in the theses reflect the according level of the Bachelor's degree, many of the theses investigated lack a sufficient level of academic writing, proper citations, and structure. Figures are often presented improperly, and chapters are written as a list of completed tasks. In other words, the theses should follow the structure of a scientific thesis or research paper, instead of having the structure and writing style of a lab report. The thesis guideline regarding referencing and organisation must be therefore revised for the higher quality and academic standards of theses **(see Finding 3)**. When students use this guideline during the thesis writing, they do not need refer to old theses and repeat structural mistakes. Furthermore, students from this programme should take the fundamental writing course from advanced programme in order to improve the academic writing skills **(see Finding 4)**.

Conclusion

The criterion is partially fulfilled.

1.3 <u>Electronics – Telecommunications Engineering (Bachelor of Engineering)</u>

Description

The curricular structure of the Electronics – Telecommunications Engineering (ETE) programme consists of 132 credits, in which 117 credits are compulsory courses and 15 credits are electives. Beside the three blocks of courses mentioned above, the study programme offers core courses and specialty courses that are taken throughout 8 semesters. The workload in each semester ranges from 15 to 18 credits. Core courses include Introduction to electrical and electronics engineering, Electric circuit analysis, Computer systems and programming languages, Digital designs, Microprocessor, Electromagnetic field, Signals and systems, Digital signal processing, and Data communications and networking. Specialty courses listed in the curriculum are Embedded system design, Communication systems engineering, Electronics circuits for communications, IC Design, and Microwave engineering.

In the semester 1, 2 and 3, students are required to take general courses such as Calculus 1 and 2, Probability and Statistics, Numerical Methods, General physics 1 and 2, General chemistry, Linear algebra, General physics labs, Physical education 1, 2 and 3, Introduction to electrical and electronics engineering, and Military training. Also in semester 3, the study programme offers courses including Introduction to Vietnamese law, Electric circuit analysis, Computer systems and programming languages, and Digital designs. Courses in semester 4 consist of Microprocessor, Electronic Circuits, Electromagnetic Field, Signals and Systems, and Marxist and Leninist philosophy. In addition, students are required to take English courses in the first four semesters. Semester 5 offers courses such as Electrical Workshop 1, Electronic Workshop 1, Marxist – Leninist political economy, Digital signal processing, Embedded system design, Communication systems engineering, and one free elective course with 3 credits. Courses including Data communications and networking, Electronics circuits and communications, IC design, Electric Workshop 2, Project 1, Internship, 1 elective in group A (in-depth specialty courses) and Scientific socialism are offered in semester 6. Students are to take courses like Microwave engineering, Project 2, History of Vietnamese Communist Party, one free elective with

3 credits and 2 electives in group A with 6 credits in semester 7. Humans and environment, Ho Chi Minh ideology, one free elective with 3 credits and 1 elective in group B (social and economics management courses) are courses offered in semester 8. Students are also required to conduct a Capstone project with 4 credits in semester 8.

For the ETE program, graduates from this programme are specialised in designing, operating, and maintaining electronics and telecommunications systems for industrial and civil applications. They can design digital, analog, and mixed signal integrated circuits, apply digital signal processing in many applications, develop telecommunication techniques and networks.

Experts' evaluation

The Electronics – Telecommunications Engineering (ETE) programme in general provides a strong and well-structured curriculum as well as motivated and qualified lecturers. For the documentation of the programme in the module handbook, the module descriptions must be revised to be more detailed and explain the methods and learning outcomes more specifically, as the current formulation does not indicate the differentiation from other study programmes **(see Finding 1)**. Still, the curriculum and specific contents of the courses in the Telecommunications Engineering programme cover all relevant fundamentals and fields. The academic degree corresponds to the learning outcomes and the requirements of the appropriate level of the European Qualifications Framework level 6 and the respective national qualifications framework. The workload is also appropriate for the programme and learning outcomes.

In some specific cases, the module handbook contents focus on outdated standards, topics and literature (e.g. EE3107 "Mobile Communications" covers the right fundamentals of wireless communications, but then focuses on legacy waveforms such as code division multiple access (CDMA) instead of Orthogonal frequency-division multiplexing (OFDM), and outdated standards such as second generation of mobile system (GSM) instead of LTE/5G/future standards). This stands in stark contrast to the high level of knowledge and state-of-the-art research of the teaching staff. Therefore, the content of certain courses should be reviewed and updated correspondingly **(Finding 7)**.

The telecommunications curriculum, as one of the standard programmes, is missing soft skill courses, as available within the advanced programme, should be also included **(see Finding 5)**. This fact was also covered by the labour market's feedback. Regarding the further preparation of students for the labour market, the programme covers several individual project-centric courses and examinations. This approach aligns with the requests from the local industry for student's individual work on technical topics.

The quality of the Bachelor's theses submitted for evaluation by the expert group displayed a considerable range. Despite the fact that the theses show a high extent of knowledge that corresponds to the Bachelor's level, a number of the examined theses exhibited shortcomings in academic writing quality, including inadequate citation practices and organisational structure. The consensus among the experts was that these theses should adhere to the conventional structure of a scientific thesis or paper rather than adopting the format and style akin to a lab report focusing on a singular task in each chapter. In many instances, the chapters of the theses resembled more of a checklist of completed tasks rather than a cohesive and appropriately structured thesis. The thesis guideline regarding referencing and structure must be therefore revised for the higher quality and academic standards of theses **(see Finding 3)**. Additionally, students should learn the fundamentals of research and academic writing more sufficiently during the programme **(see Finding 4)**. It has been reported that feedback is given at multiple time points during the thesis by the supervisors and the experts believe that the supervisors can also target the academic writing quality.

Apart from these potential points for improvement, the expert group finds that the Telecommunications Engineering programme is suitable to prepare students for the high-tech labour market in telecommunications and a wide spectrum of possible positions appropriately.

Conclusion

The criterion is partially fulfilled.

1.4 Electrical – Electronics Engineering (Bachelor of Engineering, Advanced Programme)

Description

As stated in the SER, the programme is a part of the National Project and operates according to the latest curriculum from Electrical & Computer Engineering (Department of Electrical & Computing - ECE) of the University of Illinois at Urbana-Champaign (UIUC), USA. The programme objectives and the intended learning outcomes of this programme are similar to those of traditional programmes, except that the requirement on English competence is more demanding as the programme is fully taught in English. Therefore, the curricular structure consists of only 124 credits, in which 102 credits are compulsory courses and 22 credits are electives. Students admitted to this study programme do not have to study English courses, as the requirements on their English competencies are more demanding as the programme is fully taught in English. Beside the three blocks of courses mentioned above, the study programme offers core courses and specialty courses that are taken throughout 8 semesters. The workload of each semester ranges from 14 to 17 credits.

Core courses include Introduction to electrical and computer engineering, Engineering orientation, Introduction to computing, Analog signal processing, Solid state electronic devices, Introduction to electromagnetic fields, Computer systems and programming, Digital systems, Microprocessor, Digital signal processing. In semester 6, courses are divided into four specialisations, namely Power and energy engineering, Communication system, Automatic control engineering, and Circuits-hardware system area. Each specialisation offers different specialty courses. Students can take courses such as Power electronics, Electric machinery, and Power system analysis for the specialisation in Power and energy engineering. The specialisation in Communication system offers courses on Analog and digital communications, Radio communication circuits, and Communication network. Power electronics, Sensors and Instrumentation, and Industrial automation are three courses of the specialisation in Automatic control engineering. Included in the specialisation in Circuits-hardware system area are Introduction to VLSI system design course, Embedded system, and Computer organisation and design.

In the semester 1, 2 and 3, students are required to take general courses such as Calculus 1 and 2 (Advanced programme), University physics: electricity and magnetism, Linear algebra, Physical education 1, 2 and 3, University physics – mechanics, University physics, thermodynamics – quantum physics, Introduction to ordinary differential equations, Principle of Composition, Introduction to electrical and electronics engineering, Introduction to computing, Analog signal processing, Introduction to Vietnamese law, Soft skills/Social skills, Marxist – Leninist philosophy, and Military training. Courses in semester 4 consist of Probability with engineering applications, Solid state electronic devices, Introduction to electromagnetic field, Computer system and programming, and Digital systems. Semester 5 offers courses such as Marxist – Leninist political economy, Microprocessor, Digital signal processing, and 2 electives in group A (general focus) with 6 credits. In semester 6, students should take 2 courses in one of four specialisations aforementioned, Capstone project 1, Internship, Scientific socialism course, and one free elective with 3 credits. Semester 7 comprises courses including History of Vietnamese Communist Party, one course in one of four specialisations, Capstone project 2, one free elective with 3 credits, one elective in group B (speciality courses) with 3 credits, and one elective in group C (social and economics management). Humans and environment, Ho Chi Minh ideology, one free elective with

3 credits and one elective in group B are courses offered in semester 8. Students are also required to conduct a Senior design project with 4 credits in semester 8.

The graduates from this programme may be specialised in power and energy systems, control and automation systems, or electronics and telecommunications systems. With all technical courses being delivered in English, from a selective group of instructors with at least a PhD degree from reputable institutions, graduates from the EEE (Advanced programme) are expected to perform well in a global work environment.

Experts' evaluation

Overall, this is a very high-quality international programme having the curriculum designed exactly based on the Electrical – Electronics Engineering (EE) programme at University of Illinois at Urbana-Champaign (UIUC), which is also known as a high-quality programme in this field. The total programme workload is correctly and transparently allocated to the different courses/modules. The number of credits assigned to all elements of the curriculum is also correct. All curricular elements (courses/modules) including their functions, their compulsory/elective character and their usage/exclusiveness are well-documented. In case there have been curricular modifications, they have contributed to an improvement of the programme quality, especially in terms of industry relevance through workshop training of teaching staff by industry and industry guest speakers. Overall, the curricular structure of the programme supports the achievement of the intended learning outcomes and the learner's progression. The desired qualifications to be achieved are presented as intended learning outcomes clearly. There is very strong evidence of technical depth of the programme and the high quality of graduates that the programme produced. The curriculum shows evidence to cover subject-specific and cross-subject knowledge as well as subject-related, methodological, and general skills. For example, labs are well integrated into courses/lectures such that all students have to do their own lab experiments. In particular, only groups of 20 students for labs, where they will be divided in two groups of 10. In addition, lecturers for the advanced programme must have graduated in a country with English as primary language since all courses are delivered in English. As such, the students in this programme have a better command of English language, which is extremely important for the job market in Vietnam.

The academic degree corresponds to the learning outcomes and the requirements of the appropriate level of the European Qualifications Framework level 6 and the respective national qualifications framework. This is a definite statement as this programme has been based on a very reputed EE programme in the USA. The programme is very rigorous and achieves the learning objectives that it lays out. The achievement is demonstrated upon completion of the programme with a strong curriculum and very dedicated teaching staff. There are a lot of best practices in this advanced programme that other programmes can learn from. For example, the thesis/academic writing skills course is very valuable for all students, not only for students of the advanced programme. In this course, students are taught how to write a formal document. They will focus on the reports and the final paper. This takes place in the second year. The advanced programme also provides opportunity for research projects that will require writing proposals. Furthermore, the whole process of thesis preparation and writing has been done in a very structured and high-quality way in this programme. This can be the reference model for other programmes to learn.

The intended learning outcomes reflect timely both academic and labour market requirements. This is evident from the very positive feedback from the employers in the industry as well as university. The intended learning outcomes are updated according to current developments regularly. There are annual meetings with the industry when the programme lead makes changes to the curriculum. In addition, the programme also invites representatives of the industry and asks for input and comments. More importantly, industry representatives are also part of the thesis defence committee, which is a good feedback mechanism to assess whether the learning outcomes meet the labour market requirements. Furthermore, the interactions with the industry representatives are very positive and shows a very strong linkage between industry and the programme. For

example, there are different levels for students to get direct exchange with the industry, e.g. in research when they have a topic in cooperation with the field, internships, and industry workshops. There is very high demand from industry regarding this programme, given the international environment in EE and technology business. All students have good English skills for international deployment, which is provided by industry.

Conclusion

The criterion is fulfilled.

2. Procedures for quality assurance

> **Bachelor's/Master's 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

In 2020, HCMUT issued a policy in quality assurance in which quality assurance of teaching and learning process is included as one of strategic objectives. Also, the university states that all facilities and departments have ISO 9001:2015 and lists several successful accreditation processes which concern both institutional and programme levels. The SER also mentions a set of institutional quality standards, which are said to be revised on a regular basis.

Responsible parties and implementing units are said to be active on the university, faculty, and department level, including an Office of Quality Assurance (OQA), the University Academic Council, Science Committees of the respective faculties, as well as Programme Councils.

Curriculum design and development processes are said to follow these steps: feedback from stakeholders is collected and analysed by the OQA and then forwarded to the University Academic Council, who proposes solutions and improvements to be implemented in the curriculum. Teaching and learning processes and student assessment are said to be continuously reviewed and evaluated with the help of lecturers' end of semester reports, students' course evaluations, and educational inspectors. The overall quality of the curriculum, skills and knowledge of graduates, ILOs, as well as aspects of training and services provided by the university is said to be evaluated by annual or biannual satisfaction surveys which involve online questionnaires and/or interviews with university students, university seniors, alumni, enterprises, and staff members. In addition, data on student workload, dropout rates, composition of the student body, and employment status of graduates are gathered through surveys. According to the SER, reports of collected data and feedback are submitted to the relevant units on the university, faculty, and department level and published on the OQA website. In addition to surveys and interviews, the university also offers annual student conferences as well as annual staff conferences at the department, faculty, and university level, in which the participants can voice their opinions and suggestions.

Experts' evaluation

The quality assurance system used for the study programmes under review is very well developed. The inter-action between the central university-wide Quality Assurance Unit convinced the panel of experts during the site visit. Responsibilities are clearly defined. Particularly impressive is the clear vision and mission of HCMUT. The university is applying a 5-year cycle in planning strategies, with mid-term reviews and updates. All stake-holders at HCMUT show strong efforts to act in accordance with the self-set goals and mission. Both at the management level and at the level of the faculty, the experts observed a coherent and clear alignment with the self-set goals in order to continuously develop teaching and learning. The experts confirm that the quality assurance system itself is subject to a continuous review process and that the university's management as-signs great importance to continuous optimisation and possible rapid adaptation to new evolving conditions. This is also reflected in the fact that the faculty has been awarded the ISO 9001:2015 certificate since 2010.

The implementation of various evaluations and the coordination of accreditation and certification procedures are ensured by the quality assurance unit of HCMUT. The expert panel confirms that surveys are used inten-sively within the quality assurance system. The university derives actions from the results of the university-wide surveys and attaches clear expectations to them as to when the actions should be completed. The uni-versity has provided examples for results of the surveys. During the site visit, it became apparent that all lecturers within the programmes are very concerned with the results of the module evaluations. In the course of the discussions, the experts learnt about many examples of optimisations that were carried out as a result of feedback, which shows that the modules are continuously being developed.

However, with regard to the course evaluation, the expert panel recognises that the response rate is not yet satisfactory. The teachers, the faculty and the HCMUT are also already aware of this. The experts panel con-cludes that to get a more complete picture, participation rates and coverage should be increased, e.g., through online assessments in presence **(Finding 8)**.

The feedback of employers is also requested on an ongoing basis. The representatives of the labour market show a great attachment to the graduates of the study programmes and to the university itself. The expert panel also notes that the faculty reacts very dynamically to changes. The study programmes have already been optimised multiple times in the near past.

During the site visit, the experts gained the impression that all stakeholders work together to provide ideal conditions for conducting high-quality teaching and research. The experts assess the quality management system as robust and future-oriented and have no doubt that the quality management system in place enables HCMUT to continuously develop itself and its programmes.

Conclusion

The criterion is fulfilled.

3. Learning, teaching and assessment of students

> **Bachelor's/Master's 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 HCMUT, the learning process in the programmes is conducted using a variety of strategies and techniques that help students to develop critical thinking skills, acquire relevant knowledge, and achieve all ILOs related to their individual programme. The learning methods employed in the courses are supposed to foster student-centred learning and include groupwork, lectures, blended learning, project-based learning, and experimental learning. The latter two are said to be of special importance for the study programmes as these methods are crucial in the translation of theoretical approaches to real-world engineering contexts. FEEE reports that its programmes have implemented the CDIO framework since 2099, which stresses engineering fundamentals set in the context of (1) conceiving, (2) designing, (3) implementing, and (operating) real-world systems and products. In order to support the practical/experimental parts of students' learning processes, the university states that all necessary tools, equipment, and machines are made available in open labs and workshops. The learning process is further said to be supported by an eLearning platform (BKeL) which offers students access to information, tasks and assignments, discussion forums, and the course syllabus including assessment methodology. The university states that the overall timetables of study allow for flexibility and that specific study times such as evening and weekend classes are offered in order to accommodate to the needs of part-time and employed students.

As stated in the SER, assessment takes place in the form of entrance, progress, and final tests. Assessment methods include multiple-choice and writing exams, open or closed book exams, and oral tests for project courses and is said to be based on the particular ILOs of the respective course. The decision on assessment method is made by the individual course instructor and the responsible Head of Department. The assessment schedule is organised by the Academic Affairs Office. Exam dates, deadlines, and assessment regulations are said to be published on the offices' website and the official student academic time about one month in advance. Further information is additionally disseminated via social media. The report also states that the assessment regulations are reviewed by the academic committee of the university on a regular basis.

The university states that the resitting of an exam is not permitted, but that students who have convincing reasons such as health problems will be considered by the Academic Affairs Office and may be offered to take the exam in the following semester. General appeals and complaints can be submitted via the BKeL system, the academic units of the department or the faculty, the Academic Affairs Office, and the regular surveys after each semester. Appeals and complaints with regards to assessment results can be submitted to the Academic Affairs Office which will lead to a remarking of the assessment by a different lecturer or a specific council.

Experts' evaluation

The learning and teaching methodologies at HCMUT have been defined, developed, and focussed on the student-centred learning setting through the combination of courses including (1) solid scientific knowledge and technical skills delivered by lectures, and (2) practical projects/student's group works, labs and internship. This is to recognise the great efforts from management team and group of lectures to transform the teaching methods, encourage students to play the critical role of acquiring academic knowledge (by asking questions, giving feedback to lectures or quality of the curriculum), soft skills, English language, and emphasise self-study to catch up with cutting-edge technologies and adapt to be more successful in their career advancement.

While the learning and teaching methods at HCMUT play a significant role in creating a student-centred learning environment, the observations from the expert panel and feedback gathered from lecturers, students and industry professionals reflect that the active participation of students should be stressed more. The university should study how to inspire and encourage students to be more active and independent in their learning **(Finding 9a)**. Problem-based learning with a real-world problem to solve promotes practical applications, helping students how their learning can be used in practical situations. In fact, the experts learnt during the site visit that many students entered the Management Trainee programme in multinational corporations (MNC)

environment and succeeded. So, the question here is whether the university can create the same learning environment for students to push them move forward.

According to the feedback, students are shy to raise questions or actively engage in the class due to the time limitation for the big group of students. Hence, a more effective design for class size is important to engage the students to learn in a more interactive and personalised way as well as to ensure the student-centred learning environment **(Finding 9b)**. This opportunity will facilitate students from various background in sharing their unique perspectives, enrich discussion with diverse viewpoints, and enhance critical thinking as well as communication.

The university has aligned the learning outcomes, activities, and assessment with lecturers and students, creating the connections between teaching and learning, enabling students to master the content of the course, and defining the accomplishment to obtain. Learning outcomes at HCMUT already describe the measurable skills, abilities, knowledge, or values that students should be able to demonstrate and complete the course.

The university supports students with all necessary tools, facilities, and e-learning platforms in this process. More importantly, the communication of lecturers, the Academic Affairs Office and related parties with students is very open, well-informed, and supportive to the students. The flexibility for study schedule and special priorities for students with difficult situations or employed students are clearly defined and supported. In this journey, the university has invited the industries to play the active roles to support students in terms of donating equipment, giving practical knowledge and career inspiration, providing internship and constructive meaningful feedback.

The teaching methodology from the university has created an ecosystem to support the seamless transition of knowledge from academia to real work and help students thrive in their careers by bringing more balance of the theoretical and practical knowledge. This includes a variety of teaching strategies including (1) practical application through hands-on projects, internship, case studies; (2) industry partnership provides students to expose real industry challenges, enabling them to understand how their knowledge can be used in practical scenarios; and (3) soft skills development that university is focusing beyond academic knowledge such as communication, teamwork, problem solving and critical thinking. The university has made a clear road map for learning methods that can help students reach intellectual maturity to transfer their knowledge, including practice with conceptual understanding into real world.

The university already set up transparent procedures and regulations for examination and grading scales to maintain fairness and clarity through variety of communication channels throughout lecturer's notifications, academic affairs office, and accessible guidelines via university's internal portal. The process and system are well-managed and revisited the criteria regularly by academic office affair, head of department, course instructor and academic committee. Exam dates, deadlines, and assessment regulations are said to be published on the offices' website about one month in advance. In addition to this point, the syllabi are clearly outlined for the covered topics, learning objectives, assessment methods and grading criteria.

Overall, the assessment methods with learning outcomes ensure the evaluation process is relevant and contributes to student's overall development and success. These observations reflect through the clearly defined learning outcomes for each course/module serve as a guide for students to understand with the selected appropriate assessment methods. As stated in the SER, assessment designs take place in the form of entrance, progress, and final tests. Assessment methods include multiple-choice and writing exams, open or closed book exams, and oral tests for project courses and are said to be based on the particular ILOs of the respective course.

In terms of assessment, there are clear assessment regulation for students. According to SER, the university states that the resitting of an exam is considered for students in special circumstances such as health

problems, accidents, internet connection issues (for online exams), etc. In these cases, students are allowed to postpone the current examination and to take the exam of the same course in the following semester. The experts are aware that there is always a difficult situation between maintaining academic integrity and providing flexibility for students facing challenges. Therefore, the university should have these regulations for resitting examination more transparently documented to facilitate students during their learning progress **(Finding 10)**. There is a process for general appeals and complaints that can be submitted via the BKeL system, the academic units of the department or the faculty, the Academic Affairs Office, and the regular surveys after each semester. Appeals and complaints with regards to assessment results can be submitted to the Academic Affairs Office which will lead to a remarking of the assessment by a different lecturer or a specific council.

Conclusion

The criterion is fulfilled.

4. **Student admission, progression, recognition and certification**

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

Description

HCMUT's admission policy is implemented according to the national regulations issued by the Ministry of Education and Training, and the university has to specify all standards, criteria, quota, tuition fees, and training capacity to the Ministry and related parties every year. For the last period of admission, the university reports the following schemes: (1) direct admission according to the enrolment regulations of the Ministry of Education and Training, (2) priority admission according to the regulations of VNU-HCM, (3) admission of foreign students or graduates from foreign high schools, (4) admission according to the results of the national high school graduation exam, (5) admission according to the results of the capability assessment of VNU-HCM, which is said to follow the same approach as the US SAT and the UK TSA exams. Formal requirements are said to be disseminated via public media and public events, such as the Admission Consultancy Festival.

As stated in the SER, students' progression throughout the semester is monitored via regular meetings with their Academic Advisor and the recording of grades and credit accumulation. The university states that the recognition of competences gained at other higher education institutions is clearly regulated with regards to the transfer of credits from other VNU-HCM member universities, the transfer of students who have studied abroad or at another domestic university, and the ASEAN Credit Transfer System. Informal and non-formal prior learning is said to be recognised according to subject and student-specific cases.

Upon graduation, students will receive the degree of Bachelor of Engineering, diploma supplement, an academic transcript, and a transcript of training and extracurricular activities. A temporary graduation certificate valid up to 6 months can be issued for students to apply for a job, while waiting for the official degree.

Experts' evaluation

The formal requirements and prerequisites for each programme are clearly defined and provided, as are the selection procedures. The university provides comprehensive documentation showing that all the procedures relating to admission are regulated. Also, the university presents current and past statistics of the number of

students in the study programmes. Overall, the experts gained the impression that the university analyses the study progress and actively uses it for the successful implementation of the study programmes.

According to the SER, regular meetings with Academic Advisors serve as an effective means of tracking and supporting individual student journeys. During the site visit, the experts observed the open environment for discussion between lecturers and students as well as the proactive support from lecturers when students face difficulties and have questions. This well-structured monitoring process contributes significantly to creating a supportive learning environment where students can thrive and receive the guidance they need for academic success.

The guidelines and procedures governing the recognition of courses, modules, and credits obtained from other higher education institutions and external sources are clearly defined and thoroughly communicated to students. This ensures transparency and fairness in the recognition process, enabling students to seamlessly integrate their academic experiences. However, students in the non-English taught programmes do not usually have sufficient language skills to study abroad as students in other English taught programmes (advanced programme), although English courses are also included in the curriculum. Therefore, standardising the outcome of English proficiency for students of all study programmes should be taken into account, as English plays an important role in internationalisation **(Finding 11)**.

The certificate provided to the students contains an academic transcript, and a transcript of training and extra-curricular activities, which from the experts' perspectives is more than sufficient to meet the criterion.

Conclusion

The criterion is fulfilled.

5. Teaching staff

> **Bachelor's/Master's 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

In the SER, the Faculty of Electrical and Electronical Engineering has totally 110 members and 84 of them are lecturers, including two full professors, 13 associate professors, and eight senior lecturers. Nine faculty members are doing either PhD or post-doc in overseas. Faculty members are said to have a combination of incomes: (1) a basic salary based on professional rank and experience, (2) extra income depending on annual performance in teaching, research, and service quality, (3) teaching allowance, (4) research allowance, and (5) compensation for participation in service activities of the university.

As stated by the university, transparent recruitment procedures for teaching staff have been set in place. First, a vacancy is published on the HCMUT website and further disseminated by the departments in e.g. alumni networks. As a second step, candidates submit their applications and interviews take place. The criteria for recruitment listed in the report are (1) education and academic profile, counting 50%, (2) research profile, counting 10%, (3) performance in the interview, counting 20%, and (4) foreign language skills, counting 20%. In a third step, the department proposes successful applicants to the recruitment committee of the respective

faculty, which will reassess the candidates according to the same criteria. Finally, successful applicants will be proposed to the recruitment committee of the university which will make the final decision. To be qualified for teaching in the advanced programmes, lecturers are required to have PhD degree and English fluency.

The faculty states that lecturers' duties are clearly defined by the university regulation and evaluated as an annual KPI, include tasks in teaching, research, and service. Evaluation process is said to be performed at three levels: department level, faculty level, and university level at the end of each year. A final summary report is then issued and submitted to the Board of Deans for review and planning the faculty resources for next years.

Experts' evaluation

A list of the teaching staff with their academic background, current professional career, teaching areas as well as their teaching hours and further qualification was provided. The teaching staff consist of 110 members. The faculty has two full professors, 13 associated professor, eight senior lecturers and 84 lecturers. Many of them achieved a doctoral degree in other countries such as South Korea, France, or Russia, which offers a diverse background of the staff. All teachers are permanently employed and some of them pursue the promotion plan from PhD to assistant professors. This is widely supported by the university, but the final decision is made by the government. The age distribution of the teaching body is balanced, and the qualification of the teaching staff is high and fit into international standards for lecturing. The fact that the staff is permanently employed and that the age distribution is reasonable leads to a long-term continuity in teaching. Furthermore, HCMUT has its a five-year planning which can be adapted and adjusted when needed.

The teaching staff is highly motivated. Despite the high workload, they still manage to allocate time for the students, research, and administration in the faculty. Still, the university should have other supportive schemes to balance the workload for the teaching staff to make sure the teaching staff will not feel overwhelmed and can maintain the good quality of work **(Finding 12)**. For the advanced programme, a teaching assistant is provided. Teaching is carried out with modern teaching methods and frontal lecturing is not the case at HCMUT. The intended learning outcomes as well as the learners' progression can be well achieved through the support of the teaching team. The equipment as well as the resources are adequate for teaching students in the different programmes. Teaching in social, economic, or English courses is supported by lecturers of other faculties.

Lecturers are recruited through a state system with defined transparent recruitment requirements for academic qualifications. The candidates have to go through a recruitment process. Due to the low salary from the government scheme, it might be a challenge to recruit and keep lecturers with high academic degrees. The university deals with this matter by issuing different supporting schemes in financial and career development. The development of the teaching staff is implemented through training courses in didactical skills and management provided by the university, and they are also encouraged to apply for fellow scholarships for doing research.

As for lecturers from the industry, a Master's degree is mandatory in the recruitment criteria. For the advanced programme, criteria such as a PhD degree from programmes taught in English as well as the publication of one paper per year is mandatory. In the faculty, each job position has two staff members in order to substitute for each other, in case one of them is absent. The roles and relationships of different staff members are clearly defined.

Conclusion

The criterion is fulfilled.

6. Learning resources and student support

> **Bachelor's/Master's 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

HCMUT receives funding from three sources: (1) governmental funding, (2) income from university activities, i.e. tuition fees, research grants, and services such as technology transfer, (3) sponsorship from local and international organisations.

Learning resources

The campus on which the programmes are offered includes classrooms, conference halls, lecture halls, laboratories, workshops, computer rooms, cafeterias, libraries, self-study rooms, and sports facilities. FEEE manages 14 laboratories and workshops: an electrical workshop, an electronics workshop, an information system engineering laboratory, a power engineering research laboratory, a power electronics research laboratory, a RF integrated circuits and systems laboratory, a telemedicine and mobile healthcare laboratory, a circuits and instrumentation laboratory, a control engineering and automation laboratory, an electronics laboratory, a telecommunications laboratory, a power system laboratory, an electrical engineering laboratory, and an industrial electrics laboratory. The IT facilities include computers, free Wi-Fi access, and specialised software. Also, the university provides learning management systems in which students can access course descriptions, aims, ILOs, learning outlines, teaching and learning activities, assessment methods, and learning material for each class. Students are said to have access to two libraries, the central library of HCMUT and the VNU-HCM library, which together offer access to over 400,000 books, journals, online databases, and additional media.

Student support

With regards to student support, the university offers several possibilities for academic counselling. Each student is assigned an academic advisor in their first semester and also a thesis supervisor for their internship and thesis project. Further counselling is provided by the university's Academic Affairs Office, the faculty's Academic Affairs Unit, and the individual lecturers. Financial support is offered in the form of tuition fee exemption and reduction for students with disabilities, students from lower socioeconomic backgrounds, and ethnic minorities. The university also reports that additional financial aid was provided to support students facing natural disasters and the Covid-19 epidemic. Also, the faculty disseminates information on additional scholarships provided from businesses or other universities. Furthermore, the university provides housing opportunities for staff and students. Career services are offered in the form of Career Days, alumni and lecturer support, and a Student Service and Career Centre. Medical care and psychological counselling are said to be available on campus. Students' mobility is said to be supported by the Office of External Relations, the faculty, and the individual departments. Scholarships are said to be in place. Finally, students can access supporting information online, e.g. on a Students' FAQ website, a university wiki, and the websites of the Student Support and Career Centre and the Student Association.

Experts' evaluation

The laboratory equipment, as based on the review of the provided material as well as the in-person lab visits, significantly varies in terms of suitability for the course teaching. Especially the automation lab, which is based on a sponsoring by industry, showed impressive equipment (e.g., industrial robots, sensors, programmable

logic controllers) with several parallel lab seats. This was supported by an accompanying learning programme in the course. In contrast, as based on the documentation, the sensing lab only provides minimal and non-suitable equipment or is insufficiently documented. The choice of equipment for lab workstations and laboratories is currently strongly depending on the industry's demand (e.g. automation lab choice of robotics systems, or Synopsys EDA tools) of specific licenses and labs. In this regard, the university should develop a distinct strategy concerning the actual need of the programmes and equipment. While the close cooperation is highly appreciated, the decision for specific state-of-the-art and industry-standard tools should be decided based on both industrial availability and the actual requirements of study programmes for the education purpose **(Finding 13)**.

In addition to the spatial resources, the experts also discuss the support of the students by the university and the faculty. The university provides very intensive support for its students. The experts are particularly impressed by this individual support, which ensures that students achieve lasting success in their studies. The students confirm to the experts that they receive exceptionally good support and are generally very satisfied with the level of support. The study organisational information can be found on the university's website for students and interested parties. In particular, the learning outcomes can be found broken down by category on the websites of the programmes of study.

Supporting procedures for students with special needs are in place. However, the procedures should be revised and documented more transparently to accommodate more diverse special needs of students, e.g. dyslexia **(Finding 14a)**. The discussion during the site visit brought the experts an impression that these situations have not been thoroughly considered. Furthermore, given the nature of these study programmes in engineering where male students usually outnumber female students, the university should develop a plan to attract more female students to study in this discipline **(Finding 14b)**. This approach is also in line with the current international trend.

Conclusion

The criterion is fulfilled.

7. Information

> **Bachelor's/Master's 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

As stated in the SER, information regarding the programmes, the curricula, the ILOs, and graduation requirements are published on the website of the Academic Affairs Office and the FEEE website. The websites are said to be updated on a regular basis, especially with regards to informing students about changes in regulations. In addition, social media accounts, newspapers, and public events are also used to disseminate information to the general public.

Experts' evaluation

The university has created a transparent and effective website. However, the extent of specific details of the courses is minimal. For example, the internally well-documented course plan as well as the module handbook are restrictedly accessed from external parties. Therefore, more information and details should be made

accessible to the external stakeholders such as industries, prospective students, and their parents **(Finding 15)**. Apart from that, there are multiple accessible channels at HCMUT; this already reflects that the process and structure are in place and handy for students and internal usage. Social media accounts, newspapers, and public events are also used to disseminate information to the public.

Conclusion

The criterion is fulfilled.

V.   Recommendation of the panel of experts

The panel of experts recommends accrediting the study programme **"Electrical – Electronics Engineering" (Bachelor of Engineering, Advanced Programme)** offered by **HCM University of Technology** without conditions.

The panel of experts recommends accrediting the study programmes **"Electrical Engineering" (Bachelor of Engineering)** offered by **HCM University of Technology** with conditions.

The panel of experts recommends accrediting the study programmes **"Control Engineering and Automation" (Bachelor of Engineering)** offered by **HCM University of Technology** with conditions.

The panel of experts recommends accrediting the study programmes **"Electronics – Telecommunications Engineering" (Bachelor of Engineering)** offered by **HCM University of Technology** with conditions.

Commendation:

HCMUT can be commended for aiming to be more global in its approach to education, showing a strong commitment to keeping up with worldwide academic standards. Despite a busy schedule, the teaching staff stays motivated, contributing to the success of the study programmes. The university follows the European standards well, ensuring a consistent and recognised educational experience. While there is a range in the quality of labs, from advanced to more basic setups, the university effectively collaborates with industries to make the most of available resources. The curricula, especially in technical areas, are strong, reflecting a solid educational foundation in line with global standards.

Findings:

1. The module descriptions in the module handbook of the study programmes "Electrical Engineering", "Control Engineering and Automation" and "Electronics – Telecommunications Engineering" must be revised to be more detailed and explain the methods and learning outcomes more specifically to clearly indicate the differentiation from other study programmes.

2. The curriculum development of the study programmes "Electrical Engineering" should adapt with new technology tools to keep updated with the international trends on technology development.

3. For the study programmes "Electrical Engineering", "Control Engineering and Automation", and "Electronics – Telecommunications Engineering", it is crucial to revise the academic guidelines for the final theses regarding references and formatting in order to enhance the quality of the thesis following the international standards.

4. In order to improve the academic writing skills, students of the study programmes "Electrical Engineering", "Control Engineering and Automation", and "Electronics – Telecommunications Engineering" should be offered the fundamental writing course as the advanced programme offered at HCMUT.

5. Soft skills such as independent work and critical thinking capacity should be incorporated into the curriculum of study programmes "Electrical Engineering", "Control Engineering and Automation", and "Electronics – Telecommunications Engineering".

6. Besides the constant interaction between the study programme "Control Engineering and Automation" and the industry in developing the curriculum, the independence of the study programme in making decision should be ensured to achieve the actual educational purposes of the study programme.

7. For the study programme "Electronics – Telecommunications Engineering", the content of courses should be reviewed and updated in the module handbook in terms of topics and literatures.

8. In order to get a more complete picture of the course evaluation of all study programmes, participation rates and coverage should be increased during the QA process.

9. In order to ensure the student-centred learning environment, the university is recommended to:

    a. study how to inspire and encourage students to be more active and independent in their learning.

    b. design the class size more effectively to engage students to learn in a more interactive and personalised way.

10. For all study programmes, the regulations for resitting exams should be more transparently documented to facilitate students during their learning progress.

11. The university should standardise the outcome of English proficiency for students of all study programmes, as English plays an important role in internationalisation.

12. The university should have other supportive schemes to balance the workload for the teaching staff to make sure the teaching staff will not feel overwhelmed and can maintain the good quality of work.

13. The university should develop a distinct strategy for the laboratory equipment concerning the actual need of the programmes and equipment, and the decision for specific state-of-the-art and industry-standard tools should be decided based on both industrial availability and the actual requirements of study programmes for the education purpose.

14. In order to foster the diversity approach at HCMUT, the following aspects should be implemented by the university:

    a. The supporting procedures for students with special needs should be revised and documented more transparently to accommodate more diverse special needs of students.

    b. A plan to attract more female students to study in engineering should be developed.

15. More information and details on the study programmes should be made accessible to the external stakeholders such as industries, prospective students, and their parents.