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FINAL REPORT

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY

THERMAL ENGINEERING (BACHELOR OF ENGINEERING)

September 2025



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DECISION OF THE AQAS STANDING COMMISSION ON THE STUDY PROGRAMME

▪ “THERMAL ENGINEERING” (BACHELOR OF ENGINEERING) OFFERED BY HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VIETNAM

Based on the report of the expert panel, the comments by the university, and the discussions of the AQAS Standing Commission in its 26th meeting on 8 September 2025, the AQAS Standing Commission decides:

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

The accreditation is conditional.

The study programme essentially 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. The required adjustments can be implemented within a time period of twelve months.

2. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later than **30 September 2026**. The confirmation of the conditions might include a physical site visit within the time period of twelve months.
3. The accreditation is given for the period of **six years** and is valid until **30 September 2031**, provided that the conditions listed below are fully met. Otherwise, the accreditation may be withdrawn.

Conditions

1. The questions of the multiple-choice exams must be revised so they can properly ascertain whether the course-level ILOs are achieved and to ensure the fairness of exams.
2. The Diploma Supplement must be revised to provide comprehensive and accurate information.
3. HCMUT must establish a plan to ensure the availability of senior teaching staff (i.e., Associate or full Professors) for the programme in the medium run.

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

1. The subject of Statics and Dynamics should be more strongly represented in the curriculum and Strength of Materials should be included in the mandatory subjects.
2. HCMUT should continue the efforts to increase the English language proficiency of students by providing more opportunities to acquire and practice English.
3. HCMUT should establish criteria ensuring that students are consistently assessed across different courses.
4. HCMUT should develop a more formalised system for tracking dropout rates.

5. HCMUT should more clearly outline the recognition process for academic achievements earned abroad.
6. It is recommended to establish an action plan for the enhancement of the research environment for teaching staff.
7. It is recommended to provide more opportunities for the teaching staff to improve their English language proficiency.
8. It is strongly recommended to establish a plan to update and increase facilities and equipment in the medium run.
9. It is recommended to more actively promote mobility options and guidance for students to further support student mobility.
10. HCMUT should make the website of the Thermal Engineering programme easier accessible

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

EXPERTS' REPORT

ON THE STUDY PROGRAMME

▪ “THERMAL ENGINEERING” (BACHELOR OF ENGINEERING)

OFFERED BY HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY, VIETNAM

Visit to the university: 24-26 June 2025

Panel of experts:

Prof. Dr.-Ing. Willi Nieratschker

Professor for Thermodynamics, Heat Transfer, Energy and Environmental Technology, University of Applied Science Koblenz (Germany)

Assoc. Prof. Dr. Koh Yee Kan

Professor for Thermal Systems, National University of Singapore (Singapore)

Bernhard de Vries

De Vries energy Schleeßel, Energy development/technology (Germany) (labour market representative)

Tim Giesen

Student at Technical University Clausthal (Germany) (student representative)

Coordinator:

Jana Newiger

AQAS, Cologne, Germany

I. Preamble

AQAS – Agency for Quality Assurance through Accreditation of Study Programmes – is an independent non-profit organisation supported by nearly 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 is 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 programme "**Thermal Engineering**" offered by **Ho Chi Minh City University of Technology**, Vietnam.

1. Criteria

The 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 the programme since not all indicators can necessarily be applied to every programme.

2. Approach and methodology

Initialisation

The university mandated AQAS to perform the accreditation procedure in October 2024. The university produced a Self-Evaluation Report (SER). In January 2025, 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 of statistical data of the student body (e.g. number of applications, beginners, students, graduates, student dropouts)
- the CVs of the teaching staff
- information on student services
- information on the main library
- 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 24 February 2025. The final version of the SER was submitted in May 2025.

Nomination of the expert panel

The composition of the panel of experts follows the stakeholder principle. Consequently, representatives from the respective discipline, 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 May 2025. 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 at the university took place from 24-26 June 2025. On site, the experts interviewed different stakeholders, e.g. representatives of the management of the higher education institution, the programme management, teaching staff, as well as students and graduates, in separate discussion rounds and consulted additional documentation as well as student work. The visit concluded with 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 8 September 2025. AQAS forwarded the decision to the university. The university had the right to appeal against the decision or any of the imposed conditions.

In October 2025, AQAS published the report, the result of the accreditation as well as the names of the panel members.

III. General information on the university

Ho Chi Minh City University of Technology

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 consisting of seven member universities, one research institute, two affiliated faculties, a branch in the Ben Tre province, and 25 subordinate units with scientific and technological organisations, libraries, and service-oriented educational organisations. HCMUT comprises 11 faculties and one training centre, offering 39 undergraduate programmes, 34 Master's programmes, and 27 PhD programmes. According to the SER, the university has a student body of over 23,000 students, with more than 2,100 Master's students and nearly 300 doctoral researchers.

Faculty of Mechanical Engineering

Established in 1956, the Faculty of Mechanical Engineering (FME) is said to be one of the largest and oldest faculties of HCMUT. The faculty offers seven undergraduate programmes: Mechanical Engineering, Mechatronics Engineering, Thermal Engineering, Textile Engineering, Textile and Garment Technology, Industrial Systems Engineering, and Logistics and Supply Chain Management. At the postgraduate level, it offers five programmes in Mechanical Engineering, Mechatronics Engineering, Thermal Engineering, Industrial Engineering, and Textile and Garment Technology. There are also three doctoral programmes of Mechanical Engineering, Thermal Engineering, and Textile and Garment Technology.

The faculty annually admits approximately 1,000 students. As stated in the SER, the faculty employs over 100 teaching and administrative staff, including nearly 20 professors and associate professors, over 50 PhDs, and more than 20 doctoral candidates studying abroad.

IV. Assessment of the study programme

1. Quality of the curriculum

Bachelor'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]

As stated in the SER, the curriculum of the Thermal Engineering (TE) programme is designed top-down. The Programme Objectives (POs) are said to be developed considering input from relevant parties as well as in comparison with the Vietnamese education law and related study programmes in Vietnam and abroad. The POs are identified in the SER as follows:

1. General and specialised knowledge and abilities: students have basic knowledge of mathematics and natural sciences, meeting the requirements for acquiring professional educational knowledge and the ability to study at a higher level.
2. Personal, professional, and personal skills: students have the basic technical knowledge and industry knowledge necessary to be competent to participate in solving problems related to research, design, manufacture, operation and maintenance of thermal systems.

3. Teamwork and communication skills: students have professional ethics, self-study skills, communication skills, teamwork skills, practical skills, skills in using specialised software and English proficiency sufficient to work in an interdisciplinary, multicultural environment.
4. Professional practice capacity: students have understanding of economics and politics; have basic knowledge in the field of social sciences and humanities suitable for the trained major to effectively contribute to the sustainable development of society and community.

The Intended Learning Outcomes (ILOs) are developed based on the POs and categorised into (1) knowledge, (2) skills, and (3) attitudes. The level to assess these three groups of ILOs is said to follow the Bloom's Taxonomy. The most recent revision of the curriculum was in 2019 which mainly focused on the adjustment of the number of credits required for graduation in the undergraduate programmes from 142 credits to 132 credits. Seven ILOs are defined for the TE programme:

1. Ability to identify, formulate and solve complex engineering problems based on the application of mathematical, scientific and engineering knowledge.
2. Ability to apply engineering design processes to develop appropriate solutions, taking into account relevant public health, safety, environmental, economic, cultural and social requirements.
3. Ability to communicate effectively with relevant groups.
4. Be responsible and ethical in providing technical solutions, making appropriate assessments, considering the impacts of those solutions in the global economic, environmental and social context.
5. Ability to work effectively in a team where each member demonstrates personal responsibility to achieve a common goal.
6. Ability to set up and conduct experiments, analyse and interpret data in the field of thermal engineering.
7. Ability to receive and apply new knowledge through appropriate learning and working methods.

The curriculum consists of 132 credits of the national system which is said to be equivalent to 264 ECTS according to HCMUT's regulation which was approved by Vietnamese Ministry of Education and Training.

In the first semester, students undertake foundational courses such as English 1, Calculus 1, General Chemistry, General Physics 1, and Introduction to Engineering. The second semester includes English 2, Calculus 2, General Physics Labs, General Physics 2, Linear Algebra, and Engineering Drawing. In the third semester, students take English 3, Marxist-Leninist Philosophy, Numerical Methods, Kinematics and Dynamics of Machines, General Mechanical Practice 1, and Fluid Mechanics. The fourth semester covers English 4, Marxist-Leninist Political Economy, Probability and Statistics, Fundamentals of Machine Design, Engineering Thermodynamics, and Pumps, Fans, and Compressors. During the fifth semester, students take courses such as Environment and Human, Scientific Socialism, Electrical Engineering, Refrigeration Engineering, General Thermal Practice, and Heat Transfer and Heat Exchanger. The sixth semester focuses on History of the Vietnamese Communist Party, Management for Engineers – elective course, Air Conditioning Engineering, Thermal Engineering Workshop, Steam Boilers and Burners, Elective Courses Group A, and Internship. The seventh semester is dedicated to specialised courses such as Thermal Engineering Project, Ho Chi Minh Ideology, Renewable Energy, Simulation Practice in Thermal Engineering, Elective Course Group B, and two Free Electives. In the final semester, students are required to attend the courses on Introduction to Vietnamese Law, English on Thermal Engineering, Elective Course Group B, Free Elective, and complete the Capstone Project.

The TE programme aims to train engineers capable of solving problems related to the design, manufacturing, operation, improvement, and maintenance of machinery and equipment in the heating and refrigeration sectors in factories and enterprises.

Expert evaluation

Based on the provided documentation and the discussion rounds during the site visit at HCMUT, the experts assess that the curriculum of the TE programme has a good balance of theory and practical elements to prepare students for both an academic career and the labour market. Supporting this positive impression, the representatives of the labour market praised the skills of the graduates and confirmed that, according to their experience, graduates of the TE programme have all the necessary specific knowledge to carry out thermal engineering tasks in the industry. Overall, the curriculum displays a coherent consecutive structure which progresses logically to ensure students can acquire a solid foundation before moving on to more complex subjects. The total programme workload is correctly and clearly allocated to the individual courses and, respectively, the correct number of credits in the national system is assigned to all elements of the curriculum.

According to the module descriptions, the most relevant specific and mandatory subjects for this field of study, such as Engineering Thermodynamics, Heat Transfer and Heat exchanger, Pumps, Fans, Compressors, basics in Electrical Engineering or Refrigeration contain all internationally expected content. Building on this solid foundation, additional courses are offered such as air conditioning engineering, a thermal engineering workshop or lectures on burners and steam boilers which are supplemented by regular excursions to local companies to learn on-site about specific equipment such as steam generator operators. Electives include regenerative energy technology or basic simulation tools for thermal energy technology. However, the experts noticed that basic mechanical engineering knowledge in the field of Statics and Dynamics is not adequately included in the curriculum. In addition, the subject of Strength of Materials is only included in the electives. While students still receive the necessary qualification with the current curriculum, these subjects are crucial for a comprehensive education in the field. This especially applies for international comparison, e.g., when applying for Master's programmes abroad. Against this background, the subject of Statics and Dynamics should be more strongly represented in the curriculum and Strength of Materials should be included in the mandatory subjects (**Finding 1**). As for practical elements, a mandatory internship and capstone project are included in the curriculum. Due to the increasing demand for skilled professionals in the field of Thermal Engineering, local companies leverage their collaboration with HCMUT to recruit suitable future employees. This is emphasised by the industry's provision of internships and bachelor's thesis projects for the programme which the experts see as a positive situation.

Besides subject-specific courses, students take English courses in each semester to improve their English language proficiency. Students are placed in different courses, depending on their current level. On site, the experts were introduced to the efforts of the TE programme to further promote the improvement of English skills for students. This includes, among others, providing facilities for students to hold a discussion circle where they can freely talk in English to their peers. The expert panel strongly commends these efforts which have already led to visible improvements among students. HCMUT should therefore continue these efforts to increase the English language proficiency of students by providing more opportunities to acquire and practice English (**Finding 2**). This is not only crucial for students to be competitive even for the Vietnamese labour market, but also for HCMUT's internationalisation efforts. Both of these aspects were also explicitly mentioned by labour market representatives when asked what their recommendations for programme improvement are and the experts fully agree with this.

There is a model study plan available as well as a detailed module handbook and documentation of all relevant regulations regarding the study programme, including exam regulations. This material is also available online via HCMUT's advanced Learning Management System (LMS). Students are thus adequately informed about their study programme.

Based on the extensive documentation provided by HCMUT and the interviews conducted during the site visit, the experts thus assess that the defined programme- and course-level ILOs and the curriculum of the TE programme comply with level 6 of the European Qualifications Framework (EQF). The ILOs both on

programme and course level can be achieved by graduates with the current curriculum and are well aligned with the graduate profile which is clearly defined.

Conclusion

The criterion is fulfilled.

2. Procedures for quality assurance

Bachelor'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

The quality assurance (QA) system at HCMUT is said to be operated at three levels: university, faculty, and department. At university level, the Board of Presidency (BoP) sets QA policies, while the Office of Testing and QA oversees quality across faculties. The Office of Inspection and Legislation monitors teaching, reports findings, and provides legal advice, with other departments supporting strategic planning. At faculty level, the QA team manages programme and course quality to ensure compliance with policies. The vice dean for training oversees teaching quality and updates study programmes. At department level, the department head supervises programme and course quality as well as curriculum development while faculty members assess courses, resolve issues, and address student feedback.

According to the SER, the curriculum is developed and revised based on the feedback of stakeholders, which is collected through surveys. The evaluation process is said to include the following steps: (i) Planning and preparation; (ii) Data collection; (iii) Data analysis to identify recurring feedback and areas for improvement; (iv) Developing an action plan to address identified issues; (v) Reviewing and selecting valuable feedback for improvement, and (vi) Continuous updates and improvements based on evaluation results to meet labour market needs.

The four main stakeholder groups involved in QA processes are students, alumni, employers, and faculty, each contributing to programme evaluation and improvement. Students provide feedback through course and programme surveys and participate in faculty and university conferences. Faculty design and update study programmes, assess student learning outcomes, and engage in QA activities. Employers contribute by advising on curriculum alignment with industry needs, participating in surveys, and providing feedback on graduate quality. Alumni support quality assurance by sharing insights on employment trends, participating in programme evaluations, and contributing to career services.

To close feedback loops, all stakeholders are reportedly informed of the processes and outcomes of the QA procedures through different communication channels including reports, student conferences, HCMUT's website and learning management system, newsletters, and the advisory board.

Expert evaluation

Based on the provided documentation and the discussions on site, the expert panel assesses that comprehensive and effective quality assurance procedures are in place and implemented at all levels at HCMUT to ensure the quality of the study programmes. This includes both internal and external audits. HCMUT's Quality Assurance Handbook clearly outlines all processes and is available online. Responsibilities and targets of HCMUT's QA management are thus clearly defined and published.

FME's curriculum development and improvement measures involve both internal and external stakeholders. The experts learned that the curriculum of the TE programme is reviewed every 5 years based on surveys among teaching staff, students, industry representatives, and alumni. On top of this 5-year major review, anonymous end-of-semester course evaluations are also conducted among students after each semester based on which minor revisions are implemented in the curriculum, if needed. In the same way, regular meetings and surveys are conducted with representatives of the labour market during this 5-year window. Any necessary adjustments due to market requirements or changes or feedback from internships are incorporated into the curriculum where appropriate. Through the interviews with the labour market representatives, students, and alumni, the experts thus assess that the suggestions expressed in these surveys are duly acted on by the Department and the Faculty. However, while student feedback for programme development is well considered, student involvement in decision-making processes concerning their programme is lacking at the moment. It could be beneficial to increase student involvement in the future to further strengthen the students' identification with their study programme and further enhance the overall conditions for studying.

The experts further learned that all stakeholders involved in programme development and improvement are informed about any revisions on the programme which suggests that feedback loops are closed. Feedback collection and implementation is adequately documented at all levels which ensures transparency and reliability. The expert panel thus commends HCMUT's processes for programme development.

The experts further learned that the alumni network of the TE programme in particular is very involved in the development of the programme besides regular meetings and surveys. This includes a strong relationship and exchange with both the teaching staff and responsible personnel of the programme. Alumni routinely come back to visit the department and provide valuable informal feedback on the strengths and weaknesses of the curriculum. In addition, the Department also routinely organises workshops to understand the skills and knowledge crucial for the labour market. Information from the workshops is also used to ensure that the curriculum can meet the needs of the labour market. The alumni's commitment to the TE programme is further demonstrated in their financial contribution system to support students with financial difficulties. The experts consider this close involvement of alumni on all levels and beyond feedback collection an asset of the TE programme which ensures that the curriculum constantly meets the needs of the students and supports HCMUT in providing an adequate learning environment for all students.

Overall, the experts thus assess that not only are the QA policies and procedures at HCMUT commendable in terms of comprehensiveness, implementation, and documentation, but the involvement of the alumni network in particular and the labour market in general are a strong asset for the TE programme. On site, everyone involved in the programme viewed this intense collaboration as a win-win situation and the expert panel agrees with this.

Conclusion

The criterion is fulfilled.

3. Learning, teaching and assessment of students

Bachelor'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

The SER states that the learning and teaching methods include theoretical instruction, in-class discussions, presentations, exercises, laboratory experiments, field trips, internships, projects, research papers, major assignments, self-study, and capstone projects. They are said to be developed based on surveys among alumni, employers, faculty, and fourth-year students to assess the programme's objectives and student outcomes. The learning process is said to be supported by the Bach Khoa learning management system (LMS) so students can manage their academic record, view academic schedules, register for courses, pay tuition fees, and address various academic matters throughout their studies. In addition, the blended learning approach has been implemented at HCMUT since 2022. This method is said to combine in-person instruction with online materials such as video lectures. Study timetables aim to allow flexibility, e.g., evening classes are offered to accommodate part-time students. Students of the full-time programme can switch to the part-time option and are provided with additional opportunities to finish the programme.

Student assessment at HCMUT is said to be governed by HCMUT's academic regulations, with midterm and final exams being scheduled according to the academic calendar. The Testing and Quality Assurance Office administers centralised exams in coordination with the Administrative Office, Examination Office, and faculty members. It is stated in the SER that assessment methods are outlined in the course syllabi. Students are informed about them at the start of each semester. Each course reportedly employs multiple assessment methods to align with the learning outcomes. Internships, specialised projects, and capstone projects are graded based on company evaluations, supervisor assessments, defence presentations, and examination panels, with industry representatives included in graduation project evaluations. Standardised grading criteria are said to be applied across the university.

Absence from exams is not permitted unless valid proof of extenuating circumstances is provided. In such cases, deferred examinations may be allowed in the following semester. Final course grades are entered into the university's online grading system and released within two weeks. Students can access exam papers, answer keys, and grade reports via the LMS. If they have concerns before grades are officially released, they may request a review from the instructor. After official release, students can submit grade appeals in accordance with university regulations, according to the SER.

Expert evaluation

As for learning and teaching methods implemented in the TE programme, the expert panel assesses that they are student-centred and diverse and help achieve both programme- and course-level ILOs. A wide variety of teaching methods, including lectures, laboratories, and projects, are employed to enhance the students' learning experience. The experts were particularly impressed when they learned that regular visits to local factories are organised by the department, multiple times every year. Through these factory visits, students are exposed to practical application of the knowledge they learn in the classroom. Laboratory sessions include the pre-lab interview and discussion time and are thus conducted in a manner that enables students to gain hands-on

experience with the instruments. Because of the diverse and student-centred teaching and learning techniques, the expert panel found that students are highly motivated to study, eager to learn, and actively engaged in their studies.

The Learning Management System (LMS) HCMUT provides for all study programmes is of high standard too and is comparable with Moodle. Details and information on the courses, such as content, assessment requirements, and appeal procedures can be accessed via the LMS. On site, students showed that they are familiar with the system as they were able to navigate it very easily.

Students are assessed through midterm quizzes, projects, and final exams. Final exams carry about 50% of the assessment, and in about 70% of the TE courses (including the mandatory courses), the final exams are conducted using multiple-choice questions (MCQs). While assessment methods of the TE programme are generally fit to reflect the ILOs of the courses, they are not always adequate to properly determine if students have reached the respective course-level ILOs due to the nature of the questions. The usage of MCQs in the way they are currently constructed could potentially lead to (1) the possibility of students passing the courses due to luck, and (2) a lack of differentiation between students with partial or no knowledge of the respective subject. While the format of multiple-choice exams is thus principally adequate as an assessment method for the respective courses, the included questions must be revised so they can properly ascertain whether the course-level ILOs are achieved and to ensure the fairness of exams (**Finding 3**). Possible solutions to consider for resolving this issue are (1) the implementation of negative markings for students who give a wrong answer, and (2) the breakdown of a long calculation question into sub-questions so that students with partial knowledge receive partial credits. It might also be beneficial to more strongly implement other forms of assessment in the future, especially considering that according to the ESG, assessments should be competence-based. In addition, the experts learned that the failure rate is inconsistent across different courses depending on the lecturers, with some courses having a failure rate as high as >60% (e.g., Fluids Dynamics) while others display a significantly lower failure rate. To provide reliable, transparent, and fair assessments throughout the programme, HCMUT should establish criteria ensuring that students are consistently assessed across different courses (**Finding 4**). This could also include defining a general passing rate that cannot be unreasonably low.

An asset of the programme is that labour market representatives are included in the grading of students where applicable, e.g., the capstone project and internships. This ensures that obtained skills and knowledge comply with both academic and labour market standards.

As for exam organisations, they are scheduled according to HCMUT's academic calendar. Students are informed about the exam schedule in due time via various channels, including the LMS and in class so they can properly plan and prepare for their exams. This was also confirmed by students in the discussion on site. In addition, students are also aware of the regulations for resitting exams and appeals which are transparently documented in HCMUT's examination regulations and made aware to students.

Conclusion

The criterion is partially fulfilled.

4. Student admission, progression, recognition and certification

Bachelor's degree

Consistently applied, pre-defined, and published regulations are in place which cover student admission, progression, recognition, and certification.

[ESG 1.4]

Description

Admission

HCMUT's admission policy is implemented according to the national regulations issued by the Ministry of Education and Training. Admission methods are determined annually in accordance with MOET's regulations, with five pathways currently in place. One of these, the Competency Assessment Exam of VNU-HCM (Admission Method 5), evaluates core competencies essential for academic studies through a 120-question multiple-choice test that has to be completed within 2,5 hours. The exam assesses language use, mathematics, logical thinking, data analysis, and problem-solving skills, following a structure similar to the SATs in the USA and the TSA in the UK. Since 2022, HCMUT has adjusted its admission criteria to prioritise the results of this exam for Admission Method 5. Eligibility for admission through this method requires scores in either Block A00 (Mathematics, Physics, Chemistry) or Block A01 (Mathematics, Physics, English).

Progression

Students at HCMUT register for courses each semester through an online system based on their study plan and academic progress. In special cases, such as academic difficulties or health issues, specific regulations reportedly apply to support students. The University conducts an Academic Affairs Council meeting every semester to review and adjust training-related matters. Each student is assigned a homeroom lecturer for supervision and support, while the Academic Affairs Office provides updates and counselling on regulations through the BKSI portal. During the Orientation Week, new students are introduced to university policies, schedules, and study methods. The Youth Union and Student Association organise activities to help students integrate, and administrative staff are available to assist with course registration and academic queries.

HCMUT maintains a system to track students' academic progress and results through the myBK portal, which is accessible after enrolment. This system allows students to check their records each semester, with information available to parents upon request. The Academic Affairs Office (AAO) is said to update cumulative scores, semester GPAs, and credit accumulation and provide this data to the departments. Based on these records, departments issue notifications regarding academic probation and warnings to support students in improving their performance. Homeroom lecturers meet with students at least three times per semester to provide guidance and support.

Recognition and certification

The university states that the recognition of competences gained at other higher education institutions is clearly regulated for the transfer of credits from other VNU-HCM member universities, the transfer of students who have studied abroad or at another domestic university, the ASEAN Credit Transfer System and the European Credit Transfer and Accumulation System (ECTS).

Upon graduation, students are awarded the degree of Bachelor of Engineering and receive a diploma supplement, an academic transcript as well as a transcript of training and extracurricular activities.

Expert evaluation

Based on the documentation and the discussions on site, especially with students, the experts assess that the admission requirements are clearly defined, publicly available, and properly implemented, ensuring transparency for prospective students and other potentially interested parties. The selection process for Vietnamese students is based on fair and consistent criteria, including clearly defined and adequate academic qualifications and language proficiency that ensure students admitted to the programmes can succeed in their studies. HCMUT collects data on admission outcomes of past cohorts. This data provides valuable insights for evaluating and refining the admission process and for addressing trends in student preparedness and diversity.

Student progression is thoroughly monitored through structured evaluation tools, including exam tracking, coursework assessment, and academic advisor support. The LMS MyBK further supports these efforts of individual monitoring by the teaching staff. Regular feedback loops between students and teaching staff help identify and address academic challenges early on to prevent serious issues regarding students' academic achievements. Due to these comprehensive and effective mechanisms, dropout rates of the programme remain on an appropriate level. While data on student dropouts is collected, this is not carried out very systematically. For example, there is currently no information available on the reasons for dropouts. HCMUT should therefore develop a more formalised system for tracking dropout rates (**Finding 5**). In this context, it might also be beneficial to include documentation of reasons for withdrawal in this system.

As for recognition of prior learning, there is a well-established system in place at HCMUT. However, recognition procedures, also for international applicants, are not clearly outlined yet. This holds particularly true for qualification equivalencies. For the TE programme, the latter aspect is not of immediate concern since the programme is taught in Vietnamese and thus does not primarily address international students. However, in the light of HCMUT's internationalisation efforts and ambitions, it is crucial that students of the TE programme can study abroad, e.g. for student exchanges, and have their credits obtained abroad recognised for the TE programme so that the duration of their studies does not extend. HCMUT should therefore more clearly outline the recognition process for academic achievements earned abroad (**Finding 6**). In this context, HCMUT should also more actively promote mobility options and guidance for students to support student mobility (see **Finding 12**).

Upon graduation, students receive the degree of Bachelor of Engineering along with a Diploma Supplement issued in Vietnamese and English. The Diploma Supplement includes information on content, level, and graduate profile of the TE programme. This practice is aligned with Bologna Process standards. However, the programme-level ILOs and the awarded qualification are currently not outlined on the Diploma Supplement. At the same time, a specialisation is defined on the document that does not exist in the programme. Against this background, the Diploma Supplement must be revised to provide comprehensive and accurate information (**Finding 7**). This will improve the graduates' competitiveness on the Vietnamese (and international) labour market and also increase international comparability of the awarded qualification. In addition, it might be beneficial to issue the Diploma Supplement separately, one in Vietnamese and one in English, to enhance legibility.

Conclusion

The criterion is partially fulfilled.

5. Teaching staff

Bachelor'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

The TE programme is delivered by lecturers from multiple faculties. General education courses are taught by the Faculty of Applied Sciences, the Faculty of Chemical Engineering, the Faculty of Computer Science and Engineering, the Faculty of Electrical and Electronics Engineering, the Faculty of Civil Engineering, and the Language Centre. Foundation and specialised courses are primarily covered by the Faculty of Mechanical Engineering (FME) and the Department of Heat and Refrigeration Engineering (HRE). HRE currently employs 11 lecturers: one professor, one associate professor, one senior lecturer, and eight other lecturers. Seven of these lecturers hold PhDs from universities in Europe, Canada, Japan, Australia, Korea, and the former Soviet Union. Departments and faculties can further invite adjunct lecturers on a semester basis. Their continuation is determined by feedback from students, colleagues, and the university management, as stated in the SER.

The recruitment process is said to include the formation of three independent recruitment councils to assess expertise, research ability, and pedagogical skills of applicants. According to the SER, the standard teaching load for lecturers is 300 hours per year, i.e., about 150 hours per semester with the two semesters at HCMUT comprising 17 and 18 weeks respectively in alignment with the regulations of the Vietnamese Ministry of Education and Training.

As for staff development, lecturers are reportedly encouraged to study abroad and improve their qualifications on an international level, for example through international institutions such as the Arizona State University faculty development workshops, participation in the Erasmus+ GREENUS project for curriculum development, and engagement in the AUN/SEED-Net Collaborative Education Programme. It is stated in the SER that the HRE attends professional training courses and organises specialised seminars with businesses and company visits to update lecturers on industry developments and workforce requirements.

The lecturers' key performance indicators (KPIs) are said to be evaluated based on teaching, research, and administrative responsibilities. Scientific research is assessed through projects, publications, and technology transfer initiatives. To support research activities, the university reportedly provides funding and offers incentives for publications in internationally recognised journals indexed in SCIE and Scopus, according to the SER.

Expert evaluation

With an average annual admission of 80 students to the TE programme, the teaching staff of 11 lecturers is sufficient in number. On site, lecturers explicitly stated that their current workload is feasible with 300 hours annually of teaching and 600-900 hours reserved for research depending on the academic level. The teaching staff further reported that there is also designated time for administrative tasks. However, apart from the chart of teaching hours of staff for the 2022-2023 academic year included in the SER, no evidence was provided on site for the total workload including research and administrative tasks. While there is currently only one Associate Professor assigned to the programme, it is noteworthy that seven of the lecturers of the HRE Department hold doctoral degrees from international universities. The expert panel thus assesses that the current teaching staff is not only qualified to deliver the TE programme but also contributes valuable international perspectives

and trends to the curriculum. This is highly commendable as it supports HCMUT's internationalisation efforts and informs both teaching and research of the lecturers. The dedication of the lecturers is exceptionally high, which became evident not only in discussions with the teaching staff, but more importantly with the students. However, even though the programme is currently sufficiently equipped in terms of teaching staff, the only assigned full professor is already retired. Against the background that the student body of the TE programme is relatively small compared to other programmes of the FME, it is crucial that the programme's needs and interests are sufficiently considered at faculty and central level. HCMUT must therefore establish a plan to ensure the availability of senior teaching staff (i.e., Associate or full Professors) for the programme in the medium run (**Finding 8**). This would help to ensure the programme's influence on decision-making processes at faculty and university level in the medium run, facilitating the improvement of the research environment for the staff and supporting their international visibility through publications in recognised journals.

As for didactic staff development, HCMUT has several training opportunities in place to support the didactic development of teaching staff. Most prominently, the Train the Trainer programme needs to be mentioned which is a peer-training programme for didactic skills and new teaching methods. After completing the programme, former trainees become trainers for the next cohort of lecturers. In addition, HCMUT organises workshops on different teaching-related aspects to further support didactic staff development. As the KPIs of lecturers are measured based on teaching and research activities, lecturers receive a raise if they deliver a good performance.

As for academic development of teaching staff, lecturers can use facilities at HCMUT for basic research. However, for more advanced projects, they must write a proposal or collaborate with the industry. If they want to participate in external trainings programmes that are offered by the government or the industry, teaching staff must obtain funding themselves. While teaching staff can attend international conferences, financial support for such endeavours remains limited. The same holds true for publications in international top-tier peer-reviewed journals. The experts hence assess that the good potential of the current teaching staff, especially regarding internationalisation, warrants more support. It is therefore recommended to establish an action plan for the enhancement of the research environment for teaching staff (**Finding 9**). In addition, regarding internationalisation, the experts consider it crucial that international exchange not only takes place among students but also on staff level. This includes not only exchange opportunities but also international research collaborations, attending conferences, and publishing in international journals. As all this requires an appropriate level of English, the experts recommend providing more opportunities for the teaching staff to improve their English language proficiency (**Finding 10**). This is also in line with HCMUT's plans to establish an English-language TE programme.

As for staff recruitment, HCMUT has a plan in place for when and how staff recruitment is carried out. This is based on when current teaching staff is about to retire on which information is collected at HCMUT to ensure continuity. Recruitment and selection criteria are clearly defined to ensure a fair and transparent recruitment process.

Conclusion

The criterion is partially fulfilled.

6. Learning resources and student support

Bachelor'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

Learning resources

HCMUT operates two campuses: one in Ho Chi Minh City, covering 14 hectares, and another in the Binh Duong province, spanning 26 hectares. Both campuses are said to be equipped with essential facilities, including 26,071 m² of classrooms, fully equipped laboratories, practice workshops, a library, sports fields, and a cafeteria. All classrooms are reportedly fitted with modern teaching aids such as computers, projectors, microphones, speakers, and blackboards. Dedicated study rooms and seating arrangements in hallways and other areas are available to facilitate student collaboration.

The SER states that TE students conduct practical exercises not only in central laboratories but also in 14 labs and workshops at the FME, including the Thermodynamics & Heat Transfer Laboratory, which spans 280 m² and contains over 100 practice models and measurement devices. This lab is said to undergo regular upgrades, with new equipment being supplied annually by enterprises. It is currently being expanded by an additional 130 m². The university library system provides students with access to learning resources, including VNU-HCM's central library and HCMUT's library, where textbooks, reference materials, e-books, and electronic databases can be accessed through the VNU-HCM library system.

Student support

According to the SER, HCMUT provides a range of student support activities, including direct consultation sessions with lecturers during class meetings and access to staff and lecturers in functional departments such as the AAO, the Student Affairs Office, the central library, and the Student Support Centre. According to university regulations, lecturers hold at least two office hours per week for academic consultations, with schedules posted at the faculty for student reference. Special student cases are said to be monitored by lecturers who offer individual guidance. HCMUT also organises an annual orientation and career introduction session for new students and collaborates with industry partners to conduct workshops on new technologies and emerging industry trends.

Students reportedly have access to the Psychological Counselling Room at HCMUT where experts from hospitals and counselling centres provide direct assistance during scheduled consultation hours.

Expert evaluation

The learning facilities for the TE programme at HCMUT are equipped with adequate laboratory infrastructure, including modern thermal simulation devices and access to updated refrigeration systems. Programme laboratories comply with industry-relevant standards and are equipped with modern teaching and research tools. On site, the experts learned that the renovation and updating programme for laboratories has already been initiated. Accelerating this process further will be beneficial for HCMUT to accommodate the growing integration and application of IT and digitalisation in research and teaching. While the experts assess that the laboratories and the equipment are currently appropriate for achieving the ILOs of the programme, the experts

strongly recommend establishing a plan to update and increase facilities and equipment in the medium run (**Finding 11**) to maintain this level. This will ensure the continuous provision of facilities and equipment for the programme under all circumstances which is particularly crucial as some of the equipment is sponsored by representatives of the labour market (i.e., companies), including the alumni network. While this is commendable, HCMUT will benefit from having a plan in place in case this support should be hindered in the future, especially considering HCMUT's plan to establish an English TE programme and their internationalisation ambitions in general. In this context, it might be beneficial to provide safety and instruction signs in the laboratories in English even before the launch of the English programme.

The provision of technical software meets core teaching demands and is thus adequate for delivering a Bachelor's programme. However, the experts learned that certain licenses for advanced software and simulation tools in the field of Thermal Engineering are currently not available. Providing access to these tools and software might be beneficial not just for students but also for advancing the research of the TE teaching staff. Students further have access to comprehensive course materials, both in physical and digital form. The University's LMS platform facilitates flexible learning which is commendable. Materials are frequently reviewed, with a focus on clarity and relevance. In this context, it might be beneficial to additionally provide documents and course descriptions in English to support HCMUT'S internationalisation efforts. Access to research literature, both national and international, in renowned journals and publications is provided via the extensive library catalogue at HCMUT which is also accessible online.

Incoming and outgoing exchange students are supported through dedicated mobility offices and staff guidance. Partnerships with both regional and international universities are available for student exchanges. However, during the discussions on site it became clear that not many students know about opportunities and support services regarding going abroad. The experts therefore recommend more actively promoting mobility options and guidance for students to further support student mobility (**Finding 12**). This could be achieved, among others, by offering pre-departure briefings for outgoing students and establishing more MoUs and agreements with international universities.

There are further student support services available at HCMUT which the experts deem both comprehensive and effective. The relationship between lecturers and students is characterised by intensive counselling where necessary. The close and easily accessible supervision of students is formalised by the existence of home-room lecturers. When asked about the quality of the supervision by staff members, students emphasised the very good and around-the-clock responsiveness of their lecturers. In addition, HCMUT offers several activities to welcome new students and familiarise them with the University and student life. There is also support available for financially underprivileged students such as scholarships, tuition support, and loans provided by the alumni network. To increase the proportion of female students in the programme, which is currently at 10%, the programme pursues efforts to specifically address and attract prospective female students to enrol. This includes, among others, special advertising campaigns such as promotion videos in which female students are highlighted.

Conclusion

The criterion is fulfilled.

7. Information

Bachelor'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 programme, the curriculum, the ILOs, and admission requirements are published on the website of the university. The website is said to be updated on a regular basis. In addition, social media accounts, newspapers, and public events are also used to disseminate information to all relevant stakeholders.

Expert evaluation

HCMUT operates channels where stakeholders can obtain all essential information. Information on programme details such as curriculum information, programme objectives, and ILOs are published and regularly updated on the websites of the Academic Affairs Office (AAO) and FME. Besides information on specific study programmes, AAO's website provides information on the admission process and requirements. The website is up to date and available in English, making it accessible for international students.

The department website provides detailed course information such as ILOs, content, methods of study, and assessment methods. However, the experts noticed that the TE programme is currently difficult to find on HCMUT'S website. In addition, information is only available in Vietnamese. HCMUT should therefore make the website of the Thermal Engineering programme easier accessible (**Finding 13**), especially for prospective students and other external stakeholders who are not familiar with the structure of HCMUT's websites. To increase international visibility and especially considering that an English TE programme is currently being planned at HCMUT, it would be beneficial to also provide information on the TE programme in English. The content of the website is updated regularly.

The most important channels for students to get the information related to the programme are the Bach Khoa e-learning system and MyBK system, where students can download all documents related to their study programme (e.g., course descriptions, lecturer information, assignments) and review their scores and grades.

Conclusion

The criterion is fulfilled.

V. Recommendation of the panel of experts

The panel of experts recommends accrediting the study programme “**Thermal Engineering**” offered by **Ho Chi Minh City University of Technology, Vietnam**, with conditions.

Commendation

HCMUT displays commitment to academic excellence, with a well-structured quality assurance system in place that ensures that both national and international standards of teaching and learning are met. This is also evident in the well-structured curriculum of the TE programme that balances the academic standard of the field and the needs of the labour market. The high quality of graduates of the programme was also commended by labour market representatives. The teaching staff of the programme is highly motivated and well-qualified to deliver the programme. They are very engaged and provide a trusting and supportive environment for students. Efforts of the programme to increase the proportion of female students are also very commendable. Another asset of the programme is the involvement of alumni who support the study programme in various ways from having a financial support system in place to support financially underprivileged students, sponsoring equipment via the companies they are employed at to providing internship opportunities and guest lectures. They are also involved in curriculum development both as alumni and labour market representatives. Learning and teaching is diverse and student-centred, with a state-of-the-art LMS supporting student progression.

Findings

1. The subject of Statics and Dynamics should be more strongly represented in the curriculum and Strength of Materials should be included in the mandatory subjects.
2. HCMUT should continue the efforts to increase the English language proficiency of students by providing more opportunities to acquire and practice English.
3. The questions of the multiple-choice exams must be revised so they can properly ascertain whether the course-level ILOs are achieved and to ensure the fairness of exams.
4. HCMUT should establish criteria ensuring that students are consistently assessed across different courses.
5. HCMUT should develop a more formalised system for tracking dropout rates.
6. HCMUT should more clearly outline the recognition process for academic achievements earned abroad.
7. The Diploma Supplement must be revised to provide comprehensive and accurate information.
8. HCMUT must establish a plan to ensure the availability of senior teaching staff (i.e., Associate or full Professors) for the programme in the medium run.
9. It is recommended to establish an action plan for the enhancement of the research environment for teaching staff.
10. The experts recommend providing more opportunities for the teaching staff to improve their English language proficiency.
11. The experts strongly recommend establishing a plan to update and increase facilities and equipment in the medium run.

12. The experts recommend more actively promoting mobility options and guidance for students to further support student mobility.
13. HCMUT should make the website of the Thermal Engineering programme easier accessible.