AQAS

AGENTUR FÜR
QUALITÄTSSICHERUNG DURCH
AKKREDITIERUNG VON
STUDIENGÄNGEN E.V.

# FINAL REPORT

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

# CHEMISTRY AND FOOD ENGINEERING

BIOENGINEERING (BACHELOR)

FOOD ENGINEERING (ADVANCED PROGRAMME) (BACHELOR)

PHARMACEUTICAL CHEMICAL ENGINEERING (ADVANCED PROGRAMME) (BACHELOR)

NUCLEAR ENGINEERING (BACHELOR)

September 2025

## Content

**Decision of the Accreditation Commission of AQAS ..... 3**
**I. Preamble ..... 8**
**II. Accreditation procedure ..... 8**
1. Criteria ..... 8
2. Approach and methodology ..... 8
**III. General information on the university ..... 10**
**IV. Assessment of the study programmes ..... 11**
1. Quality of the curriculum ..... 11
1.1 General aspects ..... 11
1.2 Bioengineering (Bachelor) ..... 12
1.3 Food Engineering (Advanced Programme) (Bachelor) ..... 14
1.4 Pharmaceutical Chemical Engineering (Advanced Programme) (Bachelor) ..... 16
1.5 Nuclear Engineering (Bachelor) ..... 19
2. Procedures for quality assurance ..... 22
3. Learning, teaching and assessment of students ..... 24
4. Student admission, progression, recognition and certification ..... 26
5. Teaching staff ..... 28
6. Learning resources and student support ..... 32
7. Information ..... 33
**V. Recommendation of the panel of experts ..... 35**

# DECISION OF THE AQAS STANDING COMMISSION

# ON THE STUDY PROGRAMMES

- **"BIOENGINEERING" (BACHELOR)**
- **"FOOD ENGINEERING" (ADVANCED PROGRAMME) (BACHELOR)**
- **"PHARMACEUTICAL CHEMICAL ENGINEERING" (ADVANCED PROGRAMME) (BACHELOR)**
- **"NUCLEAR ENGINEERING" (BACHELOR)**

# OFFERED BY HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY, HANOI, VIETNAM

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

1. The study programmes **"Bioengineering" (BE)**, **"Pharmaceutical Chemical Engineering" (advanced programme) (ePCE)**, **"Nuclear Engineering" (NE)**, and **"Food Engineering" (advanced programme) (eFE)** offered by **Hanoi University of Science and Technology** 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.

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**:

***All programmes***

1. HUST must implement competence-based credit recognition in line with the Lisbon Recognition Convention to streamline credit transfer and enhance international mobility.
2. HUST must revise the Diploma Supplement of all programmes under review to increase international comparability. This includes providing detailed information on learning outcomes and programme structure.

***Additionally for "Bioengineering"***

1. Bioethics and quality management need to be added to the curriculum.
2. The equipment and facilities at HUST need to be improved and updated to ensure that the programme- and course-level ILOs can be achieved by all students.
3. Access to up-to-date literature both for independent work and in lectures must be improved to reflect the current state of research in the field.

***Additionally for "Pharmaceutical Chemical Engineering (advanced programme)"***

1. Bioethics and quality management need to be added to the curriculum.
2. The equipment and facilities at HUST need to be improved and updated to ensure that the programme- and course-level ILOs can be achieved by all students.
3. The exams must be provided entirely in English if they are designated as English-language degree programmes.

***Additionally for "Nuclear Engineering"***

1. The equipment and facilities at HUST need to be improved and updated to ensure that the programme- and course-level ILOs can be achieved by all students.
2. The content of the curriculum as well as the literature used in classes must be updated to reflect current trends of the field and to better meet the needs of the labour market.
3. Access to up-to-date literature both for independent work and in lectures must be improved to reflect the current state of research in the field.

***Additionally for "Food Engineering (advanced programme)"***

1. The exams must be provided entirely in English if they are designated as English-language degree programmes.

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

***All programmes***

1. Students should be more involved in the development and improvement of the study programmes.
2. It is recommended to implement a structured graduate tracking system to evaluate the impact of admission and progression processes on graduate outcomes.
3. The engagement of labour market representatives in the development of the study programmes should be increased.
4. It is recommended to develop a standardised guideline for conducting Bachelor's theses for all departments to ensure and compare the scientific quality of theses.
5. It is strongly recommended to revise the teaching and assessment methods to ensure that all course-level ILOs can be achieved.

6. HUST should make crucial regulations and procedures, such as the student complaint procedure, more transparently and readily available to students.
7. It is recommended to implement systematic data collection and analyses on admission cohorts to evaluate and refine admission procedures.
8. It is recommended to introduce more tailored support mechanisms, such as counselling or flexible credit recovery plans, to address diverse student needs.
9. HUST should continue their efforts to get approval to issue a distinct Diploma Supplement for the ePCE programme to reflect its specialised qualification.
10. HUST should develop a strategy to enhance the teaching staff in terms of both quantity and quality.
11. It is recommended to develop a documented onboarding process for external/guest lecturers to ensure alignment with programme requirements.
12. It is recommended to expand training programmes to include modern pedagogical methods and assessment techniques.
13. It is recommended to review the workload allocation of the teaching staff to include time for curriculum updates and student mentoring.
14. It is recommended that HUST establishes measures to ensure that incoming international students gain easier access to information on support services at HUST in English.
15. Comprehensive and up-to-date information on the study programmes for all stakeholders should be presented in more detail on the available channels.
16. The availability, quality, scope, and clarity of English-language materials should be improved to address the needs of international students and stakeholders effectively, especially for the advanced programmes ePCE and eFE which are taught in English.

***Additionally for "Bioengineering"***

1. The inconsistencies in the module handbook should be revised to provide transparent, reliable und up-to-date information for all courses, especially for students.
2. The conversion error to ECTS should be corrected to increase transparency of the recognition process.
3. Hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market.

***Additionally for "Pharmaceutical Chemical Engineering (advanced programme)"***

1. Hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market.
2. HUST should provide clear, publicly available information on the applicability of political theory modules taught in Vietnamese for international students.
3. It is recommended to update the module handbook to provide transparent, comprehensive, and up-to-date information.

4. The opportunity for students to include electives in their studies should be expanded in the curriculum.
5. It is recommended to define the level of English language proficiency required for graduation and ensure that this is transparently documented and made available to interested parties.
6. HUST should implement a structured programme to enhance the English language proficiency of the teaching staff.

***Additionally for "Nuclear Engineering"***

1. Hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market.
2. Formal partnerships with nuclear power plants and research centres should be forged to ensure equitable and consistent access to hands-on learning and external internship opportunities.
3. It is recommended to include modules on nuclear ethics and societal implications in the curriculum.
4. Learning and teaching methods should be diversified, especially with regard to student-centred techniques.

***Additionally for "Food Engineering (advanced programme)"***

1. The inconsistencies in the module handbook should be revised to provide transparent, reliable und up-to-date information for all courses, especially for students.
2. It is recommended to update the equipment of the technical centre to meet the challenges of the future.
3. HUST should provide clear, publicly available information on the applicability of political theory modules taught in Vietnamese for international students.
4. HUST should implement a structured programme to enhance the English language proficiency of the teaching staff.

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

# EXPERTS' REPORT

# ON THE STUDY PROGRAMMES

- **"BIOENGINEERING" (BACHELOR)**
- **"FOOD ENGINEERING" (ADVANCED PROGRAMME) (BACHELOR)**
- **"PHARMACEUTICAL CHEMICAL ENGINEERING" (ADVANCED PROGRAMME) (BACHELOR)**
- **"NUCLEAR ENGINEERING" (BACHELOR)**

# OFFERED BY HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY, HANOI, VIETNAM

Visit to the university: 18-21 March 2025

**Panel of experts:**

| | |
|---|---|
| **Prof. Dr. Mamadou Diakité** | Fulda University of Applied Sciences, Animal Food Technology / Product Development & Design (Germany) |
| **Prof. Dr. Stefan Wittke** | Bremerhaven University of Applied Science, Professor of Biotechnology (Germany) |
| **Assoc. Prof. Dr. Huynh Quang Linh** | Ho Chi Minh City University of Technology, Biomedical Engineering – Applied Nuclear Physics (Vietnam) |
| **Dr. Tran Cao Son** | National Institute for Food Control, Deputy Director (Ha-noi/Vietnam) (representative of the labour market) |
| **Luca Stephan** | Student at Technical University Braunschweig (student representative) |

**Coordinator:**

| | |
|---|---|
| Ronny Heintze | AQAS, Cologne, Germany |
| Jana Newiger | |

## 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 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 **"Bioengineering"**, **"Pharmaceutical Chemical Engineering" (advanced programme)**, **"Nuclear Engineering"**, and **"Food Engineering" (advanced programme)** offered by **Hanoi University of Science and Technology**.

### 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 can necessarily be applied to every programme.

### 2. Approach and methodology

*Initialisation*

The university mandated AQAS to perform the accreditation procedure in March 2024. The university produced a Self-Evaluation Report (SER). In July 2024, 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
- core 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 2 December 2024. The final version of the SER was submitted in February 2025.

*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 February 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 18-21 March 2025. On site, the experts interviewed different stakeholders, e.g. representatives of the management of the higher education institution, the programme management, of 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

### *Hanoi University of Science and Technology (HUST)*

Hanoi University of Science and Technology was founded as a Professional Polytechnic University in 1956. It is said to be the first technical university with the mission of training industrial engineers and becoming a multi-disciplinary and multi-field science and technology training and research centre. The university was renamed several times and has been now known as Hanoi University of Science and Technology since 1977. Currently, there are 40 affiliated/subordinate units, including 3 general education faculties (Faculty of National Defence – Security Education, Faculty of Physical Education, Faculty of Political Theory); 10 schools/faculties/institutes for training (School of Mechanical Engineering, School of Information and Communication Technology, School of Electronics and Electrical Engineering, School of Chemistry and Life Sciences, School of Materials Science and Technology; Faculty of Mathematics and Informatics, Faculty of Engineering Physics, Faculty of Foreign Languages, Faculty of Education; School of Economics and Management); 8 research institutes and centres; 11 key laboratories and over 200 laboratories for training and research; 1 centralised administrative unit, 8 service units; and the Bach Khoa Investment and Technology Development Joint Stock Company (BK-Holdings).

As of December 2023, HUST has a total of 1,716 staff members, including 1,086 full-time lecturers, 460 administrative-support staff, 159 technical staff, and 11 research staff. 830 lecturers have doctoral degrees. HUST offers 64 undergraduate programmes, including 37 standard programmes (such as the Bioengineering programme and the Nuclear Engineering programme), 19 advanced programmes (Elitech programmes) (such as the advanced programmes in Pharmaceutical Chemical Engineering and Food Engineering), and 8 joint international programmes. At the postgraduate level, there are 44 Master's programmes and 26 doctoral programmes. As of December 2023, the university has a total of 36,229 full-time students with a student-to-lecture ratio of 33.81.

HUST's vision for 2030 is to become a pioneering innovative research university within the Vietnamese higher education system and achieving a high position in the region and the world.

### *School of Chemistry and Life Sciences (SCLS)*

The School of Chemistry and Life Sciences was founded in 2023. It consists of seven units including the School Office, the Technical Centre, Department of Chemistry, Department of Chemical Engineering, Department of Environmental Science and Technology, Department of Bioengineering, and Department of Food Technology. The school has a total of 217 staff members, including 178 lecturers (157 of which hold a doctoral degree) and 39 technicians/office staff. SCLS offers 9 programmes, including 7 standard programmes and 2 advanced programmes. The three study programmes to be accredited are Bioengineering (Bachelor), Food Engineering (Bachelor) and Pharmaceutical Chemical Engineering (Bachelor).

### *Faculty of Engineering Physics (FEP)*

The Faculty of Engineering Physics, renamed from the School of Engineering Physics in 2023, was established in 1985. The faculty consists of 6 academic groups and 1 practice centre (General Physics, Theoretical Physics, Electronic Materials, Computational Physics, Optics and Optoelectronics, Nuclear Engineering and Medical Physics, Physics Experiment Centre). The faculty currently has 70 teaching and research staff, including 2 professors, 18 associate professors, 36 lecturers having a PhD, and 12 lecturers with a Master's degree, and 2 lecturers with a Bachelor's degree.

There are three programmes offered by the FEP including Nuclear Engineering, Engineering Physics, and Medical Physics. The Nuclear Engineering programme is the one to be accredited in this cluster.

## IV. Assessment of the study programmes

### 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]*

#### 1.1 *General aspects*

It is stated in the SER that the intended learning outcomes (ILOs) of the four study programmes are in accordance with the Vietnamese National Qualifications Framework level 6 and the European Qualifications Framework (EQF) level 6. The ILOs are divided into three categories: knowledge, skills, and level of autonomy and responsibility. The programmes are said to be developed using the CDIO (Conceive-Design-Implement-Operate) approach.

There are five steps of developing a curriculum: (1) Analysing the context and training needs, taking into account political institutions, levels of socio-economic and science-technology development, cultural traditions, professional requirements and needs of the labour market; (2) determining general and specific objectives of the education and training process; (3) designing the curriculum; (4) implementing and testing the curriculum; and (5) evaluating the curriculum. The curriculum is said to be developed, adjusted, and revised based on feedback and comments of stakeholders and approved by the HUST Board of Presidency. The study programmes consist of three main components: general education (math and basic sciences, political theories, physical theories, physical education, civil service education, and English); professional education (compulsory fundamental knowledge for engineering, minor oriented elective modules, open elective, engineering practicum, and Bachelor's thesis); and engineering education (major compulsory modules, major elective modules, and engineer internship and engineer thesis).

The student workload is determined by a range of activities, including lectures, supervised study, self-study, research, practical experience, and time spent attending examinations. One HUST credit corresponds to at least 15 periods of classroom instruction (LT), or 30 periods of quiz/exercise/discussion in class (BT); or 30 periods of practice/experiment (TN), 45-90 hours of internship; 45-60 hours of projects or capstone projects. Each period is 50 minutes long. To earn one credit from courses involving theoretical or practical components, students are required to dedicate a minimum of 30 hours to self-study or preparation (TH). An academic year comprises two main semesters and a summer semester. Each main semester can be divided into two equal parts, A and B, and lasts 20 weeks. Classes are conducted over either 8 weeks (term A or B) or a 16-week period (15 weeks of instruction, 1 week for mid-term tests). Exams are scheduled for 1-2 weeks in the middle of the semester and 2–3 weeks at the end. The summer semester lasts 5 weeks of study followed by 1 week of exams and is arranged based on student demand and the availability of faculty and lecturers. According to HUST, one ECTS credit corresponds to a total of 30 hours of student workload. Consequently, the ECTS equivalent of a course at HUST is calculated by dividing the total workload in hours by 30.

### 1.2 *Bioengineering (Bachelor)*

**Description**

According to the SER, the 5 ILOs of the Bioengineering programme are designed to focus on knowledge, social and professional skills, attitude, and professional responsibilities. ILO 1 refers to in-depth specialised knowledge, ILOs 2,3, and 4 to practical skills, and ILO 5 to soft skills, working attitude, and the ability to work in an international environment. The regular study period is 4 years and consists of seven course blocks: mathematics and basic sciences, basic and core courses of engineering, soft skills, political theory and law, English, elective modules, and internship and Bachelor's thesis.

In the first semester, students undertake foundational courses such as Calculus I, Algebra, Chemistry, Introduction to Bioengineering, English I, Philosophy of Marxism and Leninism, Direction on the National Defence, and Introduction to the National Defence. The second semester includes Calculus II, Physics I, English II, Introduction to Computer Science, Political Economy of Marxism and Leninism, and General Military Education. In the third semester, students study Physics II, Organic Chemistry, Analytical Chemistry, Experimental Analytical Chemistry, and Soft Skills courses. The fourth semester covers the Calculus III, Physics III, Physical Chemistry, Physical Chemistry Lab, Biochemistry, Fundamentals of Electrical Engineering, Basic Engineering Graphics, and Process and Equipment in Biotechnology I. During the fifth semester, students take courses such as Experimental Probability Statistics, Cell Biology, Microbiology I, Process and Equipment in Biotechnology II, Experiment in Microbiology, Experiment in Biochemistry, and Ho Chi Minh's Ideology. The sixth semester focuses on Immunology, Genetic Engineering, Bio Informatics, Genetic and Molecular Biology, Analytical Method in Biotechnology, Process and Equipment in Biotechnology III, Project of Process and Equipment in Bioengineering, History of Communist Party of Vietnam, and Science Socialism. The seventh semester is dedicated to elective modules such as Environmental Biotechnology, Food Biotechnology, Industrial Biotechnology, and Molecular Biological and Cell Engineering. In the final semester, students are required to take courses including Technology for Measuring and Automatic Control in Biotechnology, Quality Product Management in Biotechnology, Project Work in Bioengineering. Students must also complete an Engineering Practicum and write the Bachelor's thesis.

It is stated in the SER that graduates of the programme have a wide range of career opportunities in fields such as applied biotechnology in medicine and pharmacy, the food industry, industrial biotechnology, and environmental biotechnology.

**Expert evaluation**

According to the SER, the most important qualification goal of the Bachelor's programme Bioengineering (BE) is to prepare students for the broad, interdisciplinary field of biotechnology and biopharmaceutical technology by combining natural sciences and engineering with subject-specific specialisations. To this end, the expert panel confirms that necessary theoretical and application-related skills and abilities are taught, so that graduates can independently carry out theoretical and practical engineering work. A positive aspect is that some students go abroad (e.g., to Australia) because of international cooperations HUST engages in.

On site, the experts learned that the programme is credit based and modular throughout. The modules represent thematically and chronologically rounded, self-contained units that are awarded appropriately allocated credit points. Generally, modules are completed within one semester. It is often possible to repeat them in the following semester (especially for courses including basic mathematical knowledge that is the foundation for other courses). The modules as well as the ILOs are adequately documented in the respective module handbook which is available to students and revised regularly. However, the module descriptions vary significantly from each other, e.g. regarding attention to detail and length. For example, some courses require attendance (e.g., Fundamentals of Chemistry (CH1018)) while others do not, without any apparent system to define

attendance requirements. In addition, the module descriptions for courses in the biochemistry lab are confusing as no formal participation requirements are defined. These inconsistencies in the module handbook should be revised to provide transparent, reliable und up-to-date information for all courses, especially for students (**Finding 1**).

Overall, the design of the programme is based on the qualification objectives and ILOs defined by the university. These include subject-specific and interdisciplinary aspects, as well as aspects that focus on social skills. Mathematical and scientific foundations, engineering and scientific foundations, biophysics, micro/molecular biology and biochemistry are taught extensively. A large compulsory elective area (elective modules 1-4) is included for individual specialisation. However, it should be noted that the compulsory elective area 1 generates 0.51 CP less in ECTS. Nevertheless, the total number of ECTS points is given as 230. There seems to be a conversion error which might confuse non-Vietnamese audiences during the recognition process and thus should be corrected (**Finding 2**). Overall, the curriculum offers sufficient opportunities for personal development and social engagement. The extent to which this also applies to aspects of bioethics and quality management is unclear, as corresponding modules (Ethics and Genetic Engineering; Biotechnology; Consequences of Technology on Society and the Environment) are not implemented in the programme. The expert panel strongly finds that such elements are required and hence need to be added to the curriculum (**Finding 3**). The structure of the programme allows for students to acquire the knowledge required for the Bachelor's level and even goes significantly beyond it. Graduates can obtain a broad and integrated knowledge and understanding of the scientific foundations of the discipline. Therefore, level 6 of the EQF is fulfilled on the formal side.

On the practical side, however, while the programme is designed for initial professional qualification, it relies heavily on the necessary further qualifications being taught externally (e.g., in companies, institutes) during the integrated practical phase as well as during the writing of the Bachelor's thesis. Overall, the practical component of the curriculum thus only amounts to 10-30%. On site, the experts learned during the discussion with industry representatives that due to the limited scope of the practical elements in the curriculum graduates struggle with working independently immediately after graduation. Instead, an initial training phase of up to 6 months is necessary in some cases. Therefore, hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market (**Finding 4**).

Another crucial reason for the graduates' limited working proficiency immediately after graduation is the equipment of the laboratories. After completing the Bachelor's programme, graduates should have a basic understanding of the complex interrelationships of biotechnological processes both at the level of organisms and products in upstream and downstream areas. With the currently available equipment this cannot be fully achieved. The laboratory for BE shown on site provides equipment (e.g., modern fermenter, sterile workbenches, rotary evaporator) the experts consider essentially suitable to deliver the programme. However, the fermenter does not have an external compressed air supply, and students that were conducting an experiment reported problems with the gas supply. In addition, the pumps on the fermenter were not used. The ILOs defined for the course "Practical work in fermentation engineering" (BF4708) which are defined as "understanding the equipment, techniques, and operating methods of industrial fermentation" and "practicing batch fermentation and fed-batch techniques" can thus not be fully achieved. Besides, it was noticeable that equipment for downstreaming (e.g., centrifuges, HPLC, gel filtration) seemed to be missing which is essential to fulfil the ILOs mentioned in the course. "Downstream processing" (BF4709) which are defined as "understanding the principles and scope of application of the recovery methods of bio-products", "skills in applying downstream processing knowledge to solve problems", and "ability to design the downstream process in actual production and research". In this context, the external practical phase of students was mentioned as a solution to make up for the partially lacking equipment at HUST. However, since this higher quality education is only available to a small proportion of students, an improvement and update of equipment and facilities at HUST is

needed to address the above-mentioned issues and to ensure that the programme- and course-level ILOs can be achieved by all students (**Finding 5**).

Since the Bachelor's theses are prepared in Vietnamese, the expert team collectively analysed the quality of student work and achievements. As a result, the panel noticed that some of the cited literature was outdated. When asked, the students reported that while they can use "open access" journals at all times, access to some renowned journals is restricted for cost reasons. The same issue is also evident in the module handbook which cites outdated research literature. Examples for outdated literature are "Analytical Chemistry/Biochemistry" (which could be replaced by the modern Lottspeich, "Bioanalytics") and "Introduction to Computer Science" (the literature used here is at least 20 years old). In the course "Quality Management in Biotechnology" (BF4726) the guidelines are outdated. E.g. the "Guide to GMP for Medicinal Products" is used in the version from 2009 but the current version is from 2022. Against this background, access to up-to-date literature both for independent work and in lectures must be improved to reflect the current state of research in the field (**Finding 6**).

The Diploma Supplement issued upon graduation is not fully sufficient for international recognition, resembling a Transcript of Records rather than a comprehensive document detailing learning outcomes, programme structure, and qualification level. This hinders the graduates' access to international Master's programmes. The Diploma Supplement should therefore be revised to increase international comparability (**Finding 7**). This includes adding information on leaning outcomes, ECTS, duration of the programme, access requirements etc.
In conclusion, while the Bioengineering programme demonstrates a solid theoretical foundation, alignment with both national and international frameworks on the appropriate level, and a well-designed curriculum that supports learner progression, its ability to fully achieve the ILOs is hindered by partially outdated curriculum content, limited practical training opportunities, and not entirely sufficient laboratory equipment. Addressing these issues will strengthen the programme's quality and relevance on the long run.

**Conclusion**
The criterion is partially fulfilled.

### 1.3 *Food Engineering (Advanced Programme) (Bachelor)*

**Description**

According to the SER, the five ILOs are designed to focus on knowledge, social and professional skills, attitudes, and professional responsibilities. ILO 1 refers to the in-depth specialised knowledge, ILOs 2,3, and 4 to practical skills, and ILO 5 to soft skills, working attitude and the ability to work in an international environment. The ILOs are said to have been reviewed and recognised by international universities such as Monash University (Australia) and Massey University (New Zealand). The regular study period is 4 years and consists of 7 course blocks: mathematics and basic sciences, basic and core courses of engineering, soft skills, political theory and law, English, elective modules, and internship and Bachelor's thesis.

In the first semester, students undertake foundational courses such as Calculus I, Algebra, Chemistry, Introduction to Bioengineering, English I, Philosophy of Marxism and Leninism, Direction on the National Defence, and Introduction to the National Defence. The second semester includes Political Economics of Marxism and Leninism, Scientific Socialism, Calculus II, General Informatics, Algebra, and General Military Education. In the third semester, students study History of Vietnamese Party, Organics Chemistry, Physical Chemistry, Physical Chemistry Lab, Analytical Chemistry, Experiments in Analytical Chemistry, Biochemistry, and Introduction to Food Technology. The fourth semester covers courses including Ho Chi Minh Ideology, Physics II, Graphic 1, Processes in Food Engineering I and II, General Microbiology, and Biochemistry Lab. During the

fifth semester, students take courses such as Electrical Engineering, Processes in Food Engineering III, General Food Technology, Nutrition, and Microbiology Lab. The sixth semester focuses on Measurement Techniques and Automated Control Theory in Food Technology, Sensory Analysis of Food, Food Physics, Food Quality Analysis, and Food Safety. The seventh semester is dedicated to courses such as General Law, Quality Management in Food Industry (+ Food Legislation), Enzyme in Food Technology, Food Microbiology and Preservation, Waste Management in Food Industry, Food Marketing, and Project in Food Technology. In the final semester, students are required to take courses including Food Rapid Analysis, Quality Management System, and Food Packaging. They must also complete a Technical Practice and write the Bachelor's thesis. From the second to the sixth semester, the study programme offers elective courses such as Introduction to Management, Applied Psychology, Technical Writing and Presentation, Soft Skills, Business Culture and Entrepreneurship, Technology and Technical Design Thinking, and Industrial Design.

It is stated in the SER that graduates of the programme are employed in the three main fields of state management, research, and manufacture.

**Expert evaluation**

The advanced Bachelor's programme Food Engineering (eFE) is characterised by a big growth market due to the high demand (conf. SER chapter 3.4) in the region. It is an applied programme with a high level of practical relevance and market acceptance in the industry (cf. SER chapter 2.2.3.4). The conditions for good interdisciplinary cooperation are required. At HUST, the framework for a good interdisciplinary cooperation exists between the different fields of the engineering department such as Bioengineering, Nuclear Engineering, Chemical Engineering. This can generally be seen as a strength of the cluster of Chemistry and Food Engineering.

The desired qualifications to be achieved during the programme are presented as ILOs. They are both subject-specific and interdisciplinary in nature. The ILOs are shown to be appropriate for level 6 of the EQF. Proof of their appropriateness was provided for the experts through evaluations, graduate surveys, and feedback from the labour market. The ILOs are regularly updated according to current developments in the academic/scientific field and the needs of the labour market. The academic degree awarded to the graduates corresponds to the ILOs and the requirements of EQF level 6 as well as to the respective level of the Vietnamese NQF. Upon completion of the programme, the achievement of the intended level of qualification is demonstrated by a final thesis/exam. All curricular elements (courses/modules) and their functions are well documented in the module handbook. The curricular structure of the study programme supports the achievement of the ILOs. The order of curricular elements supports learner progression. The curriculum covers subject-specific and cross-subject knowledge, as well as subject-related, methodological, and general skills. This is documented on the level of the ILOs. It is transparently described which elements/courses are offered exclusively for the programme and which parts are used in other programmes. It is described if the programme includes specific elements, such as project or internships. These specifics are reflected in the design of the curriculum. The total programme workload (ECTS) is correctly and transparently allocated to the different courses/modules. A correct number of credits assigned to all elements of the curriculum is available. Curricular modifications are documented in a transparent manner and contribute to an improvement in programme quality. The curriculum defines which elements are compulsory and which are electives. There is an idealised typical course plan available. However, the module descriptions and designs regarding compulsory and elective modules currently vary from each other and at times contain outdated literature. For some modules, crucial information such as responsible lecturers and examination types is missing. For certain courses, the content is not sufficiently outlined. For example, Food Engineering covers both animal raw materials such as milk and dairy products, meats and meat products as well as plant raw materials and products such as flour, starch etc. But these raw materials and products are not specified in more detail in the course description, which is particularly important for the

Diploma Supplement. Therefore, the inconsistencies in the module handbook should be revised to provide transparent, reliable und up-to-date information for all courses, especially for students (see **Finding 1**).

As for equipment, the visit to the laboratories has shown that the technical centre is very well equipped. However, the existing equipment in the technical centre is quite old. It is therefore recommended to update the equipment of the technical centre to meet the challenges of the future (**Finding 8**).

The panel also noted that the Diploma Supplement of the eFE programme includes political theory modules taught in Vietnamese, which may not be relevant for international students. While oral evidence during the site visit suggested these modules are mandatory due to national requirements, there is no clear regulation or public information addressing their applicability to international students. This lack of transparency may discourage international applicants and reduce the global attractiveness of the programmes. HUST should therefore provide clear, publicly available information on the applicability of these modules for international students in the advanced programmes (**Finding 9**). In addition, the Diploma Supplement issued upon graduation is not fully sufficient for international recognition, resembling a Transcript of Records rather than a comprehensive document detailing learning outcomes, programme structure, and qualification level. This hinders the graduates' access to international Master's programmes. The Diploma Supplement should therefore be revised to increase international comparability (see **Finding 7**).

**Conclusion**

The criterion is fulfilled.

### 1.4 *Pharmaceutical Chemical Engineering (Advanced Programme) (Bachelor)*

**Description**

According to the SER, the ILOs have been designed to align with the university's reformed academic model and address stakeholder expectations and concentrate on knowledge of pharmaceutical chemical engineering, social and professional skills, and attitudes that students are expected to acquire upon graduation. The regular study period is 4 years and consists of 7 course blocks: mathematics and basic sciences, basic and core courses of engineering, soft skills, political theory and law, English, elective specialised modules, and internship and Bachelor's thesis.

In the first semester, students undertake foundational courses such as Philosophy of Marxism and Leninism, English, Analysis I, Algebra, and Introduction to the National Defence. The second semester includes Political Economics of Marxism and Leninism, English, Chemistry I, Analysis II, Probability and Statistics, Vietnam Communist Party's Direction on the National Defence. In the third semester, students study Scientific Socialism, English, Introduction to Computer Science, Chemistry II, Organic Chemistry I, Introduction to Process Engineering, Process Fluid Mechanics, Unit Operations Laboratory I and one elective course. The fourth semester covers courses including History of Vietnamese Communist Party, Heat and Mass Transfer, Unit Operations Laboratory II, General Biochemistry, General Pharmaceutical Chemistry, Physical Chemistry Lab, Physical Chemistry, Analytical Chemistry, Analytical Chemistry Lab, Principles of Process Engineering, Applied Psychology, one elective course. During the fifth semester, students take courses such as Ho Chi Minh Ideology, Organic Chemistry Lab I, Organic Chemistry II, Organic Chemistry Lab II, Process Control and Instrumentation, Basic Pharmaceutics, Pharmaceutical Chemistry I, Soft Skills, Technology and Technical Design Thinking, Introduction to Management, Business Culture and Entrepreneurship, and one elective course. The sixth semester focuses on Kinetics and Reactor Design, Simulation and Concept Design, Spectroscopic Identification of Organic Compounds, Chemistry of Natural Products, Advanced Organic Synthesis of Medicinal Compounds, Pharmaceutical Chemistry II, Pharmaceutical Chemistry Lab I, Research Project, and Industrial Design. The seventh semester offers courses such as General Law, General Military Education, Seminar,

Structure-activity relationship, Isolation and Purification Techniques, Pharmaceutical Chemistry Lab II, Drug Design and Development, Quality Management in Pharmaceutical and Food Industry, and Fragrances and Cosmetics. The final semester is dedicated to the engineering practicum and the Bachelor's thesis.

It is stated in the SER that graduates can work as lecturers at local universities and colleges with specialised training in Pharmaceutical Chemistry, researchers at research institutes, or technicians in research and development of products, product quality monitoring, or production management at companies specialising in pharmaceuticals, functional foods, and cosmetics.

**Expert evaluation**

The advanced Bachelor's programme Pharmaceutical Chemical Engineering (ePCE) is characterised by a big growth market due to the high demand in the region. It is an applied programme taught in English with a high level of practical relevance and market acceptance in the industry. At HUST, the framework for a good interdisciplinary cooperation exists between the different fields of the Engineering department such as Bioengineering, Nuclear Engineering, and Chemical Engineering. This can generally be seen as a strength of the cluster of Chemistry and Food Engineering.

On site, the experts learned that the ePCE programme is credit-based and modular throughout. The modules represent thematically and chronologically rounded, self-contained units that each are awarded properly allocated credit points. As a rule, modules must be completed within one semester. It is often possible to repeat them in the following semester (especially in the case of mathematical foundations). The modules are adequately documented in the respective module handbook. The module handbook is available to students but has not been revised since 2020. The experts therefore recommend updating the module handbook to provide transparent, comprehensive, and up-to-date information (**Finding 10**). Information on the programme is available online. Unfortunately, only the main page of the programme is available in English. Subsequent websites such as "Education Programme Details" should be made available in English to cater to the intended international audience as well as to prospective students (see **Finding 36**).

As for the curriculum, the structure of the programme allows students to acquire the knowledge required for the Bachelor's level and even goes significantly beyond it. Graduates can obtain a broad and integrated knowledge and understanding of the scientific foundations of the discipline. Therefore, level 6 of the EQF is fulfilled on the formal side. However, in contrast to e.g. the BE programme, there is only very little space for electives included in the ePCE programme as predominantly compulsory courses are offered. Currently, only three elective courses of a total of 3 ECTS can be selected for individual specialisation. The opportunity for students to include electives in their studies should therefore be expanded in the curriculum (**Finding 11**). As for compulsory courses, the topics of quality management (GLP, GMP, GCP etc.) and bioethics in pharmaceutical engineering are missing in the curriculum and need to be added (see **Finding 3**). Based on careful discussions on site and intense analysis, the panel of experts concludes that the module "Quality management in pharmaceutical and food industry" (BF4661E) does not reflect this topic adequately. In particular for GxP, reference is made to practical phases in companies as well as laboratory visits. The extent to which this also applies to aspects of bioethics is unclear, as corresponding modules are not implemented in the programme. Even though the terms "professional ethics" and "teamwork ethics" are often mentioned, the content and resulting impact on application remained unclear to the panel of experts.

On the practical side, while the programme is designed for initial professional qualification, it relies heavily on the necessary further qualifications being taught externally (e.g., in companies or institutes) during the integrated practical phase as well as during the writing of the Bachelor's thesis. Overall, the practical component of the curriculum thus only amounts to 10-30%. The experts learned during the discussion with industry

representatives that due to the limited scope of the practical elements in the curriculum graduates struggle with working independently immediately after graduation. Instead, an initial training phase of up to 6 months is necessary in some cases. Therefore, hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market (see **Finding 4**).

Another crucial reason for the graduates' limited working proficiency immediately after graduation is the equipment of the laboratories. After completing the Bachelor's programme, graduates should have a basic understanding of the complex interrelationships of pharmaceutical engineering processes both at the level of drug development and regulatory affairs areas. This can currently not be fully achieved. The equipment of the laboratory for the ePCE programme that was shown to the experts on site is not up to date. While the lab equipment was deemed generally suitable for chemical work, i.e., chemical engineering, the experts did not find it suitable for pharmaceutical-chemical training in particular. As ePCE is an applied programme, it seems almost impossible to achieve the programme's objectives and therefore the industry's expectations with the existing equipment. It was also unclear how hazardous materials are handled, how solvents are separated, and how safety is ensured. Modern equipment for activity testing (bioactivity of extracted components) is missing. In this context, the external practical phase of students was mentioned as a solution to make up for the not entirely sufficient equipment at HUST. However, since this higher quality education is only available to a small proportion of students, an improvement and update of equipment and facilities at HUST is needed to ensure that the programme- and course-level ILOs can be achieved by all students (see **Finding 5**).

The ePCE programme is taught in English. However, based on the provided documentation it remained unclear which English level is achieved with the English courses that are being offered as part of the programme. The experts therefore recommend defining the level of English language proficiency required for graduation and ensuring that this is transparently documented and made available to interested parties (**Finding 12**). The Bachelor's theses presented were written in English and therefore possible to evaluate. One thesis was focussed on the design of a production site whereas the second one was a research thesis. Upon reviewing both theses, the experts learned that the grading was nearly similar even though the research thesis was much more complex and used modern equipment. It was also apparent that different templates were used for drafting the theses. Since the final grade is determined by three independent committees (supervisor, examiner, and council) it is crucial that internal guidelines for the writing of the theses are uniformly implemented to ensure transparency and fairness in grading. The experts therefore recommend defining standardised guidelines for the drafting of Bachelor's theses and implementing mechanisms ensuring that they are transparently documented and made available to all students (see **Finding 6 & 19**).

The panel also noted that the Diploma Supplement of the ePCE programme includes political theory modules taught in Vietnamese, which may not be relevant for international students. While oral evidence during the site visit suggested these modules are mandatory due to national requirements, there is no clear regulation or public information addressing their applicability to international students. This lack of transparency may discourage international applicants and reduce the global attractiveness of the programmes. HUST should therefore provide clear, publicly available information on the applicability of these modules for international students (see **Finding 9**). In addition, the Diploma Supplement issued upon graduation is not fully sufficient for international recognition, resembling a Transcript of Records rather than a comprehensive document detailing learning outcomes, programme structure, and qualification level. This hinders the graduates' access to international Master's programmes. The Diploma Supplement should therefore be revised to increase international comparability (see **Finding 7**). This includes adding information on leaning outcomes, ECTS, duration of the programme, access requirements etc.

In this context, the experts learned on site that, in certain aspects, there is no crucial difference between the ePCE and the Chemical Engineering programme. For example, graduates of the ePCE programme are awarded with both the Diploma Supplement and the certificate of the Chemical Engineering programme. This

means that the academic degree awarded to the graduates does not fully correspond to their actual qualification. This was discussed on site and the experts learned that this is an issue that is not in HUST's hand but rather exists due to national regulations. HUST has already taken steps to address this issue as soon as possible and before the first cohort should graduate in two years. The experts fully support this endeavour as both Diploma Supplement and certificate are crucial for the application process for both academic and non-academic positions. However, in addition to these efforts, it might be beneficial to better advertise and promote the programme both internally and externally to better highlight the differences between the ePCE and the Chemical Engineering programme.

**Conclusion**

The criterion is partially fulfilled.

### 1.5 *Nuclear Engineering (Bachelor)*

**Description**

According to the SER, the ILOs have been designed following the CDIO approach and align with the mission and vision of HUST and FEP. The ILOs concentrate on knowledge of pharmaceutical chemical engineering, social and professional skills, and attitudes that students are expected to acquire upon graduation. The regular study period is 4 years and consists of 7 course blocks: mathematics and basic sciences, basic and core courses of engineering, soft skills, political theory and law, English, elective specialised modules, and internship and Bachelor's thesis.

In the first semester, students undertake foundational courses such as Calculus I, Algebra, Fundamental Principles of Marxism-Leninism I, English I, Introduction to Nuclear Engineering, and Soft Skills. The second semester includes Calculus II, Calculus III, Physics I, Fundamental Principles of Marxism-Leninism II, General Law, and English II. In the third semester, students study Probability and Statistics, Physics II, Introduction to Computer Science, Physics III, Ho Chi Minh Ideology, and Mathematics for Nuclear Engineering. The fourth semester covers courses including Engineering Graphics I, Revolution Policy of Vietnamese Communist Party, Quantum Mechanics, Numerical Methods and Applied Programming, and Electronic Engineering. During the fifth semester, students take courses such as Nuclear Physics, Interaction of Radiation with Matter, Introduction to Accelerator, Digital Electronics for Nuclear Devices, Basic Practice, Soft Skills, and Technical Writing and Presentation. The sixth semester focuses on the Monte Carlo Method in Nuclear Engineering, Radiation Detectors, Radiation Measurement, and Dosimetry and Radiation Safety. In addition, students can select one of two courses offered in one elective module (i.e., Heat Transfer and Technical Thermodynamics or Radiobiology, and Nuclear Reactor Physics or General Physiology) and participate in an engineering internship. The seventh semester offers courses such as Nuclear Equipment and Devices, Nuclear Engineering Practice, and four elective courses which should be selected from four modules (i.e. Nuclear Thermal-Hydraulics or General Radiation Medical Imaging, Non-Destructive Testing or General Oncology Radiotherapy, Base of Radiation Application or General Nuclear Medicine, and Introduction to Environmental Physics or Medical Imaging Physics). In the final semester, students are required to take courses on Radiation Shielding, Nuclear Analysis, and Soft Skills and complete the Bachelor's thesis.

It is stated in the SER that graduates can work as lecturers at domestic universities and colleges, researchers at research institutes such as the Vietnam Academy of Science and Technology or the Vietnam Atomic Energy Institute, or engineers in research and development of products, product quality monitoring, or production management at local and international companies.

**Expert evaluation**

The Nuclear Engineering (NE) Bachelor's programme is designed to equip students with a robust foundation in nuclear physics and engineering, aligning with the CDIO approach and the university's mission. The experts assess that the ILOs of the programme are clearly defined, encompassing knowledge, professional skills, and attitudes, and are structured to meet both the Vietnamese National Qualifications Framework and the European Qualifications Framework (EQF) level 6. The curriculum is clearly documented, with one HUST credit corresponding to 30 hours of student workload which is consistent with the European Credit Transfer System (ECTS). The distribution of credits across mathematics, engineering, and elective modules is well-balanced, facilitating the achievement of the ILOs. The ILOs include subject-specific competencies, such as understanding nuclear physics and engineering principles, as well as interdisciplinary elements like soft skills and ethical considerations, which are critical for professional development. However, while the programme demonstrates strengths in theoretical grounding and alignment with international standards, the experts found on site that several areas require improvement to fully achieve the stated ILOs and meet labour market demands.

The curriculum structure supports the progression of learners through a logical sequence of courses, starting with foundational mathematics, physics, and general education in the early semesters, followed by specialised nuclear engineering courses such as Nuclear Physics, Radiation Detectors, and Monte Carlo Methods in later semesters. The inclusion of elective modules in the sixth and seventh semesters allows students to tailor their studies toward energy systems, industrial or medical physics applications, providing flexibility to align with diverse career paths. However, the curriculum's relevance is undermined by outdated content and literature references, which do not reflect current advancements in nuclear engineering, such as small modular reactors (SMRs), advanced reactor technologies, decarbonisation and AI applications etc. This misalignment with contemporary industry trends limits the programme's ability to prepare graduates for emerging roles in Vietnam's growing nuclear energy sector. In particular, the elective modules lack specialisation in energetics and nuclear power plant operations, which fails to address the pressing needs of Vietnam's current energy strategy. The panel identified this deficiency in the curriculum and deems it essential to undertake urgent and appropriate revisions. The content of the curriculum as well as the literature used in classes must therefore be updated to reflect current trends in nuclear engineering and to better meet the needs of the labour market (**Finding 13**).

The programme's alignment with labour market requirements is partially achieved through stakeholder engagement, as evidenced by the SER's mention of feedback from industry representatives. Graduates are reported to find employment as lecturers, researchers, or engineers in organisations like the Vietnam Atomic Energy Institute or international companies. However, discussions with industry representatives during the site visit revealed that graduates require an additional 6-month training period to perform independent work, particularly in practical settings such as medical physicist's operations. This indicates a gap in hands-on training within the curriculum. The limited number of laboratory sessions and engineering practicum opportunities intensifies this problem, resulting in students not receiving enough practical experience to effectively apply their theoretical knowledge. Therefore, hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market (see **Finding 4**). In addition, while the SER highlights access to laboratories, the site visit revealed that the equipment available is not entirely sufficient for advanced nuclear engineering experiments, such as those involving radiation measurement or reactor control simulators. To resolve this issue, equipment and facilities at HUST must be improved and updated (see **Finding 5**).

The academic degree essentially corresponds to EQF level 6 as the curriculum builds on foundational knowledge and progresses to specialised competencies demonstrated through coursework, internships, and the Bachelor's thesis. The thesis serves as a capstone project, requiring students to integrate theoretical and practical knowledge, but the panel noted inconsistencies in thesis assessment criteria, particularly in ensuring alignment with course learning outcomes. The lack of modern literature in thesis references further limits the academic rigor of these projects. It is therefore recommended to define standardised guidelines for the drafting

of Bachelor's theses and to implement mechanisms ensuring that they are transparently documented and made available to all students (see **Finding 19**).

The practical components of the programme, including internships and the engineering practicum, are designed to connect theoretical knowledge with hands-on application. The site visit highlighted numerous student exchange opportunities with external companies such as Toshiba, MHI, and JINED, which are a key strength of the programme's extracurricular activities. However, the dependence on external institutions for practical training results in uneven access to high-quality experiences, with only a select group of students gaining robust practical skills, leading to disparities in skill development. In addition to enhancing internal practical training facilities and equipment at HUST as mentioned above, the expert panel therefore recommends forging formal partnerships with nuclear power plants and research centres to ensure equitable and consistent access to hands-on learning and external internship opportunities (**Finding 14**).

Regarding interdisciplinary elements, the programme includes soft skills and political theory courses, which contribute to students' personal development and ethical awareness. However, the absence of dedicated modules on nuclear ethics or the societal implications of nuclear technology is a notable gap, given the field's sensitive nature. Incorporating such modules would enhance the graduates' ability to navigate complex ethical challenges in their professional roles. It is therefore recommended to include modules on nuclear ethics and societal implications in the curriculum of the NE programme (**Finding 15**).

The programme's internationalisation efforts, such as access to IAEA funding and elective specialisations, are commendable but limited by the lack of dual-degree or joint-degree programmes with international institutions. This restricts opportunities for student mobility and global exposure to some extent. The panel commends and supports the efforts already in place and encourages the department to establish dual-degree or joint-degree programmes with international nuclear engineering institutions to enhance the programme's global competitiveness.

Finally, the Diploma Supplement issued upon graduation is not fully sufficient for international recognition, resembling a Transcript of Records rather than a comprehensive document detailing learning outcomes, programme structure, and qualification level. This hinders the graduates' access to international Master's programmes. The Diploma Supplement should therefore be revised to increase international comparability (see **Finding 7**).

In conclusion, while the Nuclear Engineering programme demonstrates a solid theoretical foundation and alignment with national and international frameworks, its ability to fully achieve the ILOs is hindered by outdated curriculum content, limited practical training opportunities, and not entirely sufficient laboratory equipment. Addressing these issues through curriculum updates, enhanced practical components, and improved internationalisation efforts will strengthen the programme's quality and relevance.

**Conclusion**

The criterion is partially 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

According to the SER, HUST has implemented a quality management system based on ISO 9001:2008 since 2011, which was evaluated by the British Standards Institution. In 2019, HUST upgraded to the ISO 21001:2018 system – standards for quality management system in educational institutions.

HUST's quality management system (QMS) is structured in three levels: strategic, system, and functional. At the strategic level, the University Council sets overall policies and strategies, while the Board of Presidency implements quality assurance (QA) according to national, regional, and international standards. Strategic goals are translated into detailed plans for functional units which then develop their own objectives. At the system level, the Department of Quality Management (DQM) oversees the development and implementation of QA plans, coordinates with various units to monitor quality, and ensures compliance with ISO procedures. Key activities include stakeholder surveys, process improvement according to ISO 21001 standards, and using accreditation results for continuous improvement according to the PCDA cycle. Plan (P), Do (D), Check (C), and Act (A). This approach is said to align with ISO standards and supports the achievement of one of the United Nations' 17 Sustainable Development Goals – Quality Education. At the functional level, academic units and administrative offices carry out QA activities based on their specific roles and the university's QA plan. The Schools and Faculties under the university, functional departments have established to manage these tasks including: Ensuring enrolment and admission quality; QA in programme development; QA of training activities; QA in management and organisation of training activities; measurement and assessment of programme quality; trainings for international integration and internationalisation orientation; QA of student output; QA of processes in research activities; QA in organisation of research activities; QA to support training and research processes; QA to support learners; requirements on community service and knowledge transfer; evaluation and accreditation of QA service; self-assessment activities; internal/peer-level assessment; external assessment and accreditation; activities after external assessment and implementation of control and improvement.

The programme quality assessment process is said to be a core QA activity of SCLS and FEP and involves all levels (university, school/faculty, and programme). At the university level, the Department of Quality Management (DQM) develops and oversees internal assessment and accreditation plans. At the school/faculty level, QA teams led by training heads and Programme Development Council members monitor and evaluate teaching and learning activities. At the programme level, the Programme Development Council designs and adjusts curricula based on stakeholder feedback, while academic groups handle course design, teaching, and assessment, with proposals for improvements reviewed by the School/Faculty Council.

As stated in the SER, all relevant stakeholders (students, graduates, lecturers, staff, alumni, employers) participate in the QA process, specifically in QA activities such as developing programmes, improving facilities,

learning resources, and student services, etc. In addition to using surveys or questionnaires as tools to collect feedback from these stakeholders, the university holds meetings to provide a discussion platform. Data is said to be collected from these stakeholders as well and analysed to inform effective management and continuous improvement of programme quality. Information, gathered through surveys and feedback, is incorporated into the QA information system and linked to the management information system. Key data include student demographics, learning progress, graduation numbers, employment rates, student satisfaction, lecturer effectiveness, and the adequacy of learning resources.

**Expert evaluation**

HUST's quality management system is structured in three levels: strategic, systemic, and functional. To get a better understanding of the efficacy for the different evaluation systems being used for monitoring the different programmes at the department level, the experts conducted several talks about this topic with different stakeholder groups during the site visit. The different perspectives from teaching staff and students from the reviewed programmes showed a congruent perception of the evaluation systems to be very useful for assuring the programmes' quality. For instance, the teaching staff showed some results of previous course evaluations which already showed a high standard of the courses. Furthermore, the lecturers are informed about each other's evaluation results. The panel of experts considers this as an additional incentive for lecturers to improve their own performance. However, the experts would like to highlight that the anonymity of the students must continue to be guaranteed because participation is mandatory.

The participation in the course evaluation is mandatory for students. Therefore, a high response rate of students is ensured by this evaluation system. Consequently, a reliable basis for the identification of problems and solid feedback for the teaching staff is guaranteed. The teaching staff of the different programmes showed a high interest in student feedback. According to the students' response, the conversion of the students' feedback into an improvement of the teaching seems to be ensured. Besides the course evaluation, however, the discussion with the students showed that they should be more involved in the development and improvement of the study programmes (**Finding 16**). This also includes the analysis of statistical data on student progression (e.g., student composition, study duration, completion rate, grade distribution, failed/completed exams) with the aim of better optimising the programmes. During the site visit, the expert learned that information on the responsibilities for the administration and quality assurance of the different programmes is clearly regulated and accessible to students.

HUST has an internal quality assurance team which controls the programmes regularly. Corrections to the programmes are carried out regularly. This cycle also contains a follow-up observation of the modifications. Regular meetings and seminars take place to control the progress and the quality of the different programmes. Minor problems in the curricula are being solved right away, whereas more substantial modifications of the programmes are planned and implemented regularly in a cyclical manner. The evaluation system also includes information on alumni employment through tracer studies that are conducted several months after graduation. The SER further provides evidence of stakeholder engagement, including employer feedback, to validate the appropriateness of admission and progression processes. Employment data indicate that graduates secure roles in relevant sectors (e.g., Vietnam Atomic Energy Institute for Nuclear Engineering graduates), suggesting alignment with labour market needs. However, the panel found limited evidence of systematic graduate tracking or employer surveys to assess the long-term impact of these processes on graduate outcomes. A structured graduate tracking system would provide valuable data to refine admission criteria and progression support. It is therefore recommended to implement a structured graduate tracking system to evaluate the impact of admission and progression processes on graduate outcomes (**Finding 17**).

The teaching staff also takes an active role in the improvement of the programmes at department level through feedback and suggestions for reforms. However, the cooperation between the departments and the industry seems to be an area in which more effort should be made to utilise synergies of cooperations. While the level of cooperation is already good with regard to internships, it should be improved with regard to collecting feedback for programme development and improvement. The conversation with industry representatives on site provided information about certain industry needs which should also be taken into account by the university when revising their study programmes. For example, while the programmes under review are on the Bachelor's level, labour market representatives seem to be more interested in research and graduates who are capable of conducting research. This means that corresponding Master's programmes should be considered to better accommodate labour market requirements and demands. Against this background, the experts recommend increasing the engagement of labour market representatives in the development of the study programmes (**Finding 18**).

In terms of financial sustainability, particularly the NE programme's low enrolment raises concerns about long-term financial sustainability, as HUST relies heavily on tuition fees. The lack of a defined strategy to tackle this issue could threaten the programme's long-term sustainability. It might therefore be beneficial to develop a financial sustainability plan for low-enrolment programmes like NE, potentially through external funding or partnerships.

As for research output of students, it is crucial to better regulate the quality standards of research, especially given HUST's goal of being one of the best universities in Asia. Therefore, the experts recommend developing a standardised guideline for the conduct of Bachelor's theses for all departments to ensure and compare the scientific quality of theses (**Finding 19**). According to the teaching staff of the eFE programme, this guideline already exists, but, unfortunately, it was not available for the experts to assess it on site.

**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**

According to the SER, the study programmes employ various teaching and learning methods including traditional methods such as lectures, presentations and blended-learning by combining in-class sessions with online learning. This includes lectures, teaching assistance, project-based learning, research-oriented learning, practice-based learning, and experimental learning. The SER further outlines that teaching methods are customised to cater to full-time students, part-time students, international students as well as students with disabilities.

The Bachelor's programmes are designed for completion in four years (eight semesters), though students may graduate early or extend their studies by up to five additional semesters. Students can register for 12-24 Vietnamese credits per main semester, with an average of 20 credits, and up to 8 credits in the summer semester.

Mid-term exams are typically held in the ninth week of each main semester. Assessment methods are said to vary depending on the course objectives and contents and include (1) attendance check and class discussions; (2) quizzes; (3) written tests; (4) multiple-choice tests; (5) individual project assignments; (6) group project assignments; (7) computer-based exams; (8) assessment by lecturers and examiners (for internships, graduation theses, and research projects); (9) thesis defences (for graduation theses and research projects). As stated in the SER, the university publishes its annual study plan and exam schedule, specifying exam times, locations, and result communication methods. Exam schedules, based on course outlines, are available online, on bulletin boards, and via emails. Midterm and final exams are graded on a 10-point scale. Final exams must take up at least 50% of the total grade. A score lower than 3 (or 5 for theses) results in failure, and component scores below 4 lead to an overall F grade. Passing grades require at least a D for regular courses and higher than a C for theses. Course scores are then converted to a 4.0 scale for GPA calculations. Students receive a semester GPA and a cumulative GPA to track overall academic performance. HUST states to allow students to appeal exam results by filing a grade enquiry within one week. If unsatisfied with the lecturer's explanation, they can request regrading through the School's office. A panel of 2-3 lecturers reviews the enquiry, and the updated results are posted on HUST's internal information system for transparency. Students may also discuss their grades with their supervisor.

As stated in the SER, HUST provides support policies for students with disabilities to ensure equal opportunities and integration, including financial aid, learning materials, facilities, and mental health care activities. Special provisions are also in place for students unable to attend exams due to illness, accidents, or other valid reasons. Such students may take a make-up midterm exam, or alternative assessments as arranged by the lecturer. For final exams, students may be granted a deferral, allowing them to complete the exam within the next two regular semesters.

**Expert evaluation**

The implementation of teaching and learning methods that facilitate student-centred learning varies between the programmes under review. During the discussion round with students of the programmes on site, the experts learned that most lecturers in the eFE programme employ interactive formats such as presentations and blended learning to cater to different types of learners. However, several courses in the NE programme predominantly rely on more traditional learning methods such as lectures, where students mostly interact with the instructor. Even though some lectures in the NE programme use blended learning formats, a higher proportion of interactive content will likely lead to increased student engagement. The experts thus recommend diversifying the learning and teaching methods implemented in the NE programme, especially with regard to student-centred techniques (**Finding 20**).

As for the practical skills included in the course-level ILOs, their achievement does not always seem to be reflected in the current teaching and assessment methods. The experts therefore strongly recommend revising the teaching and assessment methods to ensure that all course-level ILOs can be achieved (**Finding 21**). All programmes under review convey an appropriate number of soft skills, enabling students to easily adapt to new situations. During the discussion on site, labour market representatives were especially satisfied with the students' interpersonal and communication skills.

Assessment regulations and procedures are published as part of the module handbooks and include, among others, mitigating circumstances, illnesses, and absence. The regulations are outlined by the respective lecturers during the first lecture of each course and thus well-known by students. While a formal procedure for student complaints is in place, students did not seem to be aware of it when asked during the discussion round. Therefore, the experts recommend making crucial regulations and procedures, such as the student complaint

procedure, more transparently and readily available to students (**Finding 22**). For example, the most important regulations and procedures for students could be outlined during the annual orientation week.

On site, the experts learned that some assessments in the English-taught advanced programmes (eFE and ePCE) include tasks in Vietnamese. Not only does this prevent foreign students from taking the exams, but it also defeats the purpose of a programme that is explicitly intended to be taught in English. Therefore, the exams in the advanced programmes eFE and ePCE must be provided entirely in English if they are designated as English-language degree programmes (**Finding 23**).

**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*

As of 2024, there are three main paths for admission: talent selection, selection based on the results of the National High School Graduation Exam (NHSGE), and selection based on the results of the Thinking Skills Test (TSA) exam, admitting about 20%, 50%, and 30% of the admission quota respectively. Admission to the four programmes follows the general regulations outlined in the university's admissions plan. However, the English-taught programmes Food Engineering and Pharmaceutical Chemical Engineering have additional English language proficiency requirements of which candidates must meet one of the following: a VSTEP English certificate at B1 level or higher, an IELTS (Academic) score of at least 5.0 (or equivalent), or a minimum score of 6.5/10 in English on the 2023 high school graduation exam.

*Progression*

HUST manages student training and academic progress through the Student Information System (SIS), which provides access to academic records, GPA, CPA, accumulated credits, and other details. Students can plan their studies proactively, while parents are given accounts to monitor their children's progress and receive notifications of academic warnings. The Academic Advisor Board monitors students and assigns advisors to support underperforming individuals. Academic warnings result in restrictions on the maximum credits a student can register for: 18 credits at warning level 1, 14 at level 2, and expulsion from the programme at level 3. These measures aim to help students focus on improving their performance.

*Recognition and certification*

The SER outlines that credits earned at HUST can be transferred internationally through the ECTS system. A credit recognition exchange programme gives students the opportunity to study up to two semesters at one of HUST's partner universities. The recognition process differs in accordance with the agreement signed between the respective university and HUST.

To be eligible for graduation, students are said to have to meet the following conditions: complete all required courses, including Physical Education and Civil Service Education, within the prescribed timeframe; achieve the required foreign language proficiency; maintain a cumulative GPA of 2.0 or higher for courses registered

for graduation; not be subject to disciplinary action, suspension, or expulsion; and not be under criminal investigation at the time of graduation consideration. Upon completion, graduates receive a degree certificate, transcript, and supplement detailing completed courses, grades, and accumulated credits according to the ECTS system. The degree is issued in Vietnamese and English.

**Expert evaluation**

The programmes under review have established clear regulations for student admission, progression, recognition, and certification, which are publicly available through the university's website and align with national frameworks. However, while these processes demonstrate a structured approach, several areas require improvement to fully meet the European Standards and Guidelines (ESG) and enhance internationalisation, transparency, and alignment with global academic and labour market expectations.

*Admission*

The admission process is well-defined and follows three main pathways: talent selection (20%), selection based on the National High School Graduation Exam (NHSGE) (50%), and selection based on the Thinking Skills Test (TSA) (30%). These pathways are transparently outlined in HUST's admissions plan, accessible via the university's website in both Vietnamese and English, ensuring clarity for prospective students. Specific prerequisites, such as English language proficiency for the English-taught eFE and ePCE programmes (e.g., VSTEP B1, IELTS 5.0, or equivalent), are clearly communicated and necessary for successful participation, given the programmes' international orientation. The panel finds these requirements appropriate, as they ensure students have the linguistic and academic foundation to engage with the curriculum effectively. However, there is limited evidence in the SER regarding the systematic collection and analysis of data on past admission cohorts to evaluate the effectiveness of these pathways. Such data could inform adjustments to admission criteria to better align with programme demands and student success rates. It is therefore recommended to implement systematic data collection and analyses on admission cohorts to evaluate and refine admission procedures (**Finding 24**).

*Progression*

HUST's Student Information System (SIS) provides a robust platform for managing student progression, allowing students, parents, and academic advisors to monitor academic records, GPA, cumulative credits, and academic warnings. The system supports proactive study planning and timely interventions for underperforming students through academic advisors and restrictions on credit registration (e.g., 18 credits at warning level 1, 14 at level 2, and expulsion at level 3). These measures are clearly documented and contribute to student retention and progression by encouraging focused academic improvement. The panel appreciates the structured support provided by the Academic Advisor Board, which aligns with ESG standards for student-centred learning. However, discussions with students during the site visit indicated that some students find the academic warning system restrictive, particularly when external factors (e.g., personal circumstances) affect performance, and there is limited flexibility for individualised support. The panel recommends introducing more tailored support mechanisms, such as counselling or flexible credit recovery plans, to address diverse student needs (**Finding 25**).

*Recognition*

The recognition of credits is facilitated through HUST's adoption of the European Credit Transfer System (ECTS), which supports credit transfer for up to two semesters at partner universities. The SER outlines that recognition processes are governed by inter-university agreements, ensuring transparency and alignment with programme learning outcomes. However, the current reliance on detailed course mapping and prior agreements limits flexibility and hinders broader student mobility, particularly for non-formal or informal learning. The panel notes that HUST has not fully implemented competence-based recognition in line with the Lisbon

Recognition Convention, which would enhance internationalisation and support seamless credit transfer. For instance, students participating in exchange programmes reported during the site visit that the credit recognition process can be lengthy and bureaucratic, delaying their academic progression. HUST must therefore implement competence-based credit recognition in line with the Lisbon Recognition Convention to streamline credit transfer and enhance mobility (**Finding 26**). Additionally, the lack of publicly available information on the recognition process for international students creates a barrier to transparency. It would be beneficial to publish detailed guidelines on credit recognition procedures for international students.

*Certification*

Upon graduation, students receive a degree certificate, transcript, and a supplement detailing completed courses, grades, and credits in accordance with the ECTS system, issued in both Vietnamese and English. These documents are intended to provide transparent information on the qualification gained. However, the Diploma Supplement currently resembles a Transcript of Records and lacks comprehensive details on learning outcomes, programme structure, and qualification level, which are critical for international recognition and access to Master's programmes abroad. This issue was also noted in other programme evaluations (e.g., BE and ePCE) and is particularly significant for the NE, given its low enrolment and need for global competitiveness. HUST must therefore revise the Diploma Supplement of all programmes under review to increase international comparability. This includes providing detailed information on learning outcomes and programme structure (**Finding 27**). Furthermore, for the ePCE programme, the certification process is still aligned with Chemical Engineering standards, which does not fully reflect the programme's specialised focus. This is due to national regulations. HUST has already taken steps to solve this issue as soon as possible and before the first cohort will graduate in two years. The experts fully support this and recommend that HUST should continue their efforts to get approval to issue a distinct Diploma Supplement for the ePCE programme to reflect its specialised qualification (**Finding 28**).

In conclusion, the programmes under review have established transparent and structured processes for student admission, progression, recognition, and certification, aligning with national regulations and supporting student success. However, challenges remain in implementing competence-based credit recognition and ensuring international compatibility of the Diploma Supplement, providing transparency for international students. Addressing these issues through the proposed findings will enhance the programmes' alignment with ESG standards and global academic and labour market expectations.

**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**

In 2023, HUST had a total of 1,716 staff members, of which 1,086 are lecturers. 76.4% of the lecturers hold a PhD degree, 22.6% hold Master's degrees, and 1% hold Bachelor's degrees. As stated in the SER, workload is determined based on the average weekly working hours, distributed among teaching (T), research (R), and

service (S) tasks, with hours represented as round numbers. Each job position has a defined workload standard. For full-time staff, the standard workload is 48 hours per week. Lecturers are required to fulfil 18 hours of teaching, 18 hours of research, and 4 hours of service work/management per week.

The SER states that HUST has implemented a recruitment project to attract young, talented candidates and distinguished scientists, aiming to build a core team of leading scientific staff to advance research and technology transfer. By 2025, the project expects to recruit about 30 young lecturers under 40 with outstanding research achievements. In 2023, HUST focused on enhancing its management capacity by subjecting staff to strategic management and professional development training in collaboration with education experts and businesses. Staff promotion is said to be based on seniority, teaching and research accomplishments, and contributions to the university community.

The number of lecturers engaged in each study programme is listed below:

- Bioengineering: a total of 24 lecturers including 1 professor, 6 associate professors, and 17 full-time lecturers, of which 76% hold a PhD degree. The lecturer-student ratio is 0.23.
- Food Engineering: a total of 27 lecturers including 12 associate professors, 14 full-time lecturers, and 1 vising professor/lecturer. All of them hold a PhD degree. The lecturer-student ratio is 0.55.
- Pharmaceutical Chemical Engineering: a total of 31 lecturers including 1 professor, 17 associate professors, 13 lecturers, and 2 vising professors/lecturers. All of them hold a PhD degree. The lecturer-student ratio is 0.39.
- Nuclear Engineering: a total of 12 lecturers including 3 associate professors, 7 lecturers, and 2 visiting professors/lecturers, of which 66.7% hold a PhD degree. The others hold a Master's degree. The lecturer-student ratio is 0.24.

The criteria for recruitment are publicly available on HUST's website, as stated in the SER. The recruitment process involves receiving applications and organising examinations and interviews by the recruitment committee. New lecturers undergo a one-year probationary period. In order to pass the probation, they must teach in an examination conducted by the academic group, the faculty, the school, and the Department of Organisation and Personnel.

Regarding staff development, the university states that those staff members not holding a PhD yet are encouraged to pursue a PhD programme at universities in countries such as Germany, Austria, the United States, the United Kingdom, and Australia. Lecturers can join short-term training courses such as postdoctoral courses, summer schools, scientific conferences, workshops, and other professional events. The university also organised short-term courses for the improvement of English language proficiency as well as pedagogical and professional skills. HUST is said to have a regulation research duty of academic staff and provides incentives such as financial support depending on the performance level in the previous year.

**Expert evaluation**

The teaching staff at HUST for the Bachelor's programmes under review are generally well-qualified and sufficient in number to support the delivery of the programmes. The staff composition, recruitment processes, and development initiatives align with the university's mission and the European Standards and Guidelines (ESG). However, challenges related to English proficiency, PhD qualification rates in certain programmes, and the need for enhanced professional development in modern teaching methods and industry-relevant skills require attention to fully achieve the ILOs of the programmes and meet labour market expectations.

As of 2023, HUST employs 1,716 staff members, including 1,086 lecturers, of whom 76.4% hold PhD degrees, 22.6% hold Master's degrees, and 1% hold Bachelor's degrees. HUST's overall lecturer-to-student ratio in

2023 is 1:33.8, according to the SER. The lecturer-to-student ratios for the programmes under review, as presented in Tables 3.5.6, 3.5.9, 3.5.13, and 3.5.17 in the SER do not accurately reflect the "appropriateness" required to ensure the achievement of the ILOs. The appropriate calculation should consider the average number of students over the entire four-year programme divided by the average number of lecturers. According to this method, when recalculated based on the data from the above-mentioned tables for the period 2019–2023, the estimated ratios for the programmes are approximately 1:18.1 for BE, 1:9.3 for eFE, 1:8.1 for ePCE, and 1:13.9 for NE. These ratios are relatively ideal, indicating sufficient staffing resources to support the training needs of the programmes under review. Nevertheless, these figures may still lack precision, as lecturers may simultaneously teach across multiple programmes. With the university's overall ratio of 1:33.8 being relatively high compared to the expectations for a top-tier university, the need to recruit new lecturers who meet both quantity and quality requirements is evident. HUST should therefore develop a strategy to enhance the teaching staff in terms of both quantity and quality (**Finding 29**).

Additionally, the SER provides detailed information on the teaching staff, including academic qualifications, research achievements, and teaching responsibilities, which are appropriate for delivering the ILOs. For instance, the BE programme has 24 lecturers (76% with PhDs), eFE has 27 lecturers (all with PhDs), ePCE has 31 lecturers (all with PhDs), and NE has 12 lecturers (66.7% with PhDs). The inclusion of visiting professors in eFE, ePCE, and NE enhances the programmes' academic and industry perspectives. However, the lower PhD rate in NE (66.7%) compared to other programmes may limit the programme's capacity to deliver advanced research-oriented content, particularly given its alignment with international standards like IAEA guidelines. It might therefore be beneficial to prioritise initiatives to increase the PhD rate among the NE teaching staff to strengthen academic rigor and research quality.

Overall, the teaching staff are competent in their respective fields, with qualifications that support the delivery of subject-specific and interdisciplinary ILOs, such as nuclear physics, biotechnology, and pharmaceutical chemistry. Lecturers are engaged in research and technology transfer, which enriches their teaching with current scientific developments. However, site visit discussions revealed that not all staff in the English-taught programmes eFE and ePCE demonstrate sufficient confidence in English communication, impacting the quality of instruction and student engagement. This issue is particularly pronounced in ePCE, where the programme's international orientation demands high English proficiency. The expert panel thus recommends implementing a structured programme to enhance the English language proficiency of the teaching staff of the eFE and ePCE programmes (**Finding 30**). This might include targeted training and international exchange opportunities. Additionally, while the staff are qualified in theoretical instruction, their ability to deliver practical, industry-relevant training is limited by outdated laboratory equipment and not sufficient hands-on experience, as noted in the evaluations of the BE, ePCE, and NE programmes. The experts therefore suggest increasing opportunities for staff to engage in industry collaborations and practical training to enhance their ability to deliver industry-relevant skills such as inviting part-time professionals from the industry and developing an international staff development plan (e.g., scholarships, sabbaticals).

HUST's recruitment process is transparent and publicly available on the university's website, involving application reviews, examinations, and interviews conducted by a recruitment committee. New lecturers undergo a one-year probationary period, during which they must demonstrate teaching competence through evaluations by academic groups, faculties, and the Department of Organisation and Personnel. The inclusion of visiting professors/lecturers, particularly in the eFE, ePCE, and NE programmes, ensures that external expertise is integrated into the programmes. However, the panel noted during the site visit that the recruitment process does not explicitly prioritise candidates with international teaching experience or industry exposure, which could enhance the programmes' global competitiveness and alignment with labour market needs. It might therefore be beneficial to revise recruitment criteria in the long run to prioritise candidates with international and industry experience, particularly for the advanced programmes under review. Furthermore, the process

for onboarding and familiarising external/guest lecturers with programme requirements is not clearly documented, which may lead to inconsistencies in teaching quality. It is therefore recommended to develop a documented onboarding process for external/guest lecturers to ensure alignment with programme requirements (**Finding 31**).

HUST implements a robust staff development framework, encouraging lecturers without PhDs to pursue doctoral programmes at prestigious international institutions (e.g., in Germany, Australia, the UK). The university also offers short-term training opportunities, such as postdoctoral courses, summer schools, and workshops, as well as courses to improve English proficiency, pedagogical skills, and professional competencies. Financial incentives based on research performance further motivate staff development. The panel commends these initiatives, which align with ESG standards for continuous professional development. However, both the SER and site visit discussions indicate that training in modern teaching methods (e.g., project-based learning, blended learning) and assessment techniques is limited, particularly for ensuring that assessments align with course-level ILOs. This issue was also noted in the general evaluations across all programmes, where assessment consistency needs improvement. The experts thus recommend expanding training programmes to include modern pedagogical methods and assessment techniques (**Finding 32**). Additionally, while HUST supports international training, the lack of structured faculty exchange programmes, such as sabbaticals, with international nuclear engineering or biotechnology institutions, limits opportunities for staff to gain global perspectives. It might therefore be beneficial to establish structured faculty exchange programmes with international institutions.

The standard workload for lecturers (48 hours per week, with 18 hours teaching, 18 hours research, and 4 hours service) is clearly defined and appropriate for delivering the programmes. The SER confirms that teaching staff are contracted for the duration of the accreditation period (six years), ensuring continuity. However, the panel noted during the site visit that the workload allocation does not account for additional responsibilities, such as mentoring students during internships or updating course materials to reflect current trends, which may strain staff capacity, particularly in low-enrolment programmes like the NE programme. The panel therefore recommends reviewing the workload allocation to include time for curriculum updates and student mentoring (**Finding 33**).

In conclusion, the teaching staff at HUST are well-qualified, with appropriate recruitment and development processes in place to support the delivery of the Bachelor's programmes. However, challenges related to English proficiency in English-taught programmes, limited training in modern teaching methods, and extensive workload might potentially have an impact on the full achievement of the ILOs. Addressing these issues through targeted training, and sustainable workload planning will further enhance the programmes' quality and alignment with ESG standards.

**Conclusion**

The criterion is 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*

HUST's campus includes 293 classrooms, 406 laboratories and practice rooms, two auditoriums, and a library. The university provides indoor and outdoor sports facilities such as fitness, aerobics, football fields, a tennis court, and a swimming pool, a medical centre, dining places, as well as photocopy shops, stationery stores, ATMs, and vending machines. For practical experience, laboratories and practice workshops and centres are available of which 23 belong to SCLS and are said to be equipped with high-tech machines and devices. The library includes seven reading and borrowing rooms with 1,500 seats for readers, as stated in the SER. In addition to 16,050 internal documents including theses and dissertations, HUST provides students and staff with access to electronic resources such as ProQuest Central, E-books Ebrary, and ScienceDirect.

*Student support*

The SER outlines that there are several scholarships to support students during their studies, namely Study Incentive Scholarships for students with outstanding performance; Tran Dai Nghia Scholarship for students living in difficult economic conditions; Sponsored Scholarships from individuals, organisations, and businesses both domestic and international; International Student Exchange Scholarships; HUST Scholarships to support students with short-term internships abroad; and Scholarships from bilateral and multilateral international co-operation sources. In addition to scholarships, HUST is said to offer student support in various ways, including academic advising, administrative assistance, career orientation, job counselling, psychological support, health care, extracurricular activities, and financial aid.

Support for students in terms of introduction to ILOs and career orientation is provided at the admission stage, according to the SER. Upon admission, the faculty holds meetings to introduce staff, the programme, and assist students with course registration. During their studies, students are assigned class managers and academic advisors for support. The faculty also uses social media platforms to offer counselling and share information on learning, scholarships, and job opportunities. Events like the "Admission Counselling and Career Orientation Day" provide guidance for prospective students. The Student Information System (SIS) tracks academic progress, while class managers and advisors assist with study plans and resources. The orientation week introduces new students to university life, and career guidance is provided throughout their studies.

### Expert evaluation

As for the facilities and equipment that are available to deliver the programmes under review, HUST currently relies on their industry partners to deliver a large fraction of the practical skills outlined in the ILOs. Even though the technical equipment used in the eFE programme is somewhat outdated, it is still capable of delivering the relevant practical skills. However, this is not the case for the BE, ePCE, and NE programmes (see above, section on Quality of the curriculum). To ensure that all programme- and course-level ILOs can be achieved by all students, the practical courses in the BE programme need more up-to-date equipment. The same holds true for the other two programmes as outlined above. The equipment available for the ePCE strongly reflects

the programme's roots in the chemical engineering field. Hence, the equipment is not adequate to cater to the needs of the pharmaceutical engineering programme. As students can complete their internship in both chemical and pharmaceutical companies the achievement of specifically pharmaceutical engineering ILOs like GMP cannot be guaranteed with the current equipment. For the NE programme, the equipment available is not entirely sufficient for advanced nuclear engineering experiments, such as those involving radiation measurement or reactor simulations. HUST must therefore expand and update the equipment of the BE, ePCE, and NE programmes (see **Finding 5**).

The student support structures in place at HUST cater to the diverse student body. Counselling for both academic and non-academic matters is offered at all stages of the student life cycle. Several scholarships options allow for students with a low-income background to partake in higher education as well. The orientation week at the start of each academic year provides students with the necessary information on services that are relevant for their current state of studies. This is particularly beneficial for new students. In terms of internationalisation, HUST has a broad network of partner universities providing students with plenty of options to study abroad. In this context, several scholarships are available for students as well. Outgoing students at HUST are made aware of these services and adequately supported. However, the experts learned on site that information on support for incoming international students is not always easily accessible in English. It is therefore recommended that HUST establishes measures to ensure that incoming international students gain easier access to information on support services at HUST (**Finding 34**).

**Conclusion**

The criterion is partially 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, HUST provides updated training information to students and stakeholders through multiple channels, primarily via the official HUST, SCLS, and FEP websites. Functional units within the university also share specific information on their respective sites. Additionally, HUST communicates with stakeholders using various social platforms, all of which are linked to the university's main website. The content is available in both Vietnamese and English to ensure accessibility for international students and stakeholders.
According to the SER, the university publishes information on programmes, facilities, learning environments, notable research activities, admission and career orientation processes as well as on financial support and scholarship opportunities, and dormitory registration for students on its website. After registration, students receive information on the following aspects: admission and enrolment, programmes including ILOs, degree and training level, teaching, assessment and examination activities, student handbook, tuition fees and scholarships, and employment and recruitment.

**Expert evaluation**

Information is disseminated by HUST using a multi-channel approach, including the official websites of HUST, SCLS, and FEP along with various social media platforms in both Vietnamese and English. The panel of

experts was also positively impressed by the level of knowledge of the interviewed students about regulations and implemented practice. The panel concludes that once on site, students are provided well with required information and the exchange works well. At the same time, in the light of the growing international intentions of the university, the availability of publicly available documents such as ILOs, and other special guidelines for international students (e.g., subjects that international students are not required to take such as philosophy and politics, some civil service education subjects) are currently not sufficiently showcased online. Therefore, comprehensive and up-to-date information on the study programmes for all stakeholders should be presented in more detail on the available channels (**Finding 35**). Moreover, the experts learned that some materials concerning the advanced, i.e., English, programmes are partially written in Vietnamese. The availability, quality, scope, and clarity of English-language materials should thus be improved to address the needs of international students and stakeholders effectively, especially for the advanced programmes ePCE and eFE (**Finding 36**).

**Conclusion**

The criterion is fulfilled.

## V. Recommendation of the panel of experts

The panel of experts recommends accrediting the study programmes **"Bioengineering"**, **"Pharmaceutical Chemical Engineering" (advanced programme)**, **"Nuclear Engineering"**, and **"Food Engineering" (advanced programme)** offered by **Hanoi University of Science and Technology** with conditions.

### Commendation

The programmes under review demonstrate solid theoretical foundations and overall alignment with national and international frameworks. HUST's quality management system is robust and well-structured, ensuring the continuous monitoring and development of the study programmes. All programmes under review have established transparent and structured processes for student admission, progression, recognition, and certification, aligning with national regulations and supporting student success. The teaching staff at HUST are highly motivated and well-qualified, with appropriate recruitment and development processes in place to support the delivery of the Bachelor's programmes. HUST's student support structures cater to the diverse student body and include services spanning all stages of the student life cycle. Information is disseminated by HUST via multiple channels in both Vietnamese and English.

### Findings

1. BE, eFE: The inconsistencies in the module handbook should be revised to provide transparent, reliable und up-to-date information for all courses, especially for students.
2. BE: The conversion error to ECTS should be corrected to increase transparency of the recognition process.
3. BE, ePCE: Bioethics and quality management need to be added to the curriculum.
4. BE, ePCE, NE: Hands-on laboratory sessions should be expanded in the curriculum to better prepare students for the labour market.
5. BE, ePCE, NE: The equipment and facilities at HUST need to be improved and updated to ensure that the programme- and course-level ILOs can be achieved by all students.
6. BE & NE: Access to up-to-date literature both for independent work and in lectures must be improved to reflect the current state of research in the field.
7. The Diploma Supplement of all programmes under review should be revised to increase international comparability.
8. eFE: It is recommended to update the equipment of the technical centre to meet the challenges of the future.
9. eFE, ePCE: HUST should provide clear, publicly available information on the applicability of political theory modules taught in Vietnamese for international students in the advanced programmes.
10. ePCE: The experts recommend updating the module handbook to provide transparent, comprehensive, and up-to-date information.
11. ePCE: The opportunity for students to include electives in their studies should be expanded in the curriculum.
12. ePCE: The experts recommend defining the level of English language proficiency required for graduation and ensuring that this is transparently documented and made available to interested parties.
13. NE: The content of the curriculum as well as the literature used in classes must be updated to reflect current trends of the field and to better meet the needs of the labour market.
14. NE: The expert panel recommends forging formal partnerships with nuclear power plants and research centres to ensure equitable and consistent access to hands-on learning and external internship opportunities.

15. NE: It is recommended to include modules on nuclear ethics and societal implications in the curriculum.
16. Students should be more involved in the development and improvement of the study programmes.
17. It is recommended to implement a structured graduate tracking system to evaluate the impact of admission and progression processes on graduate outcomes.
18. The experts recommend increasing the engagement of labour market representatives in the development of the study programmes.
19. The experts recommend developing a standardised guideline for conducting Bachelor's theses for all departments to ensure and compare the scientific quality of theses.
20. NE: The experts recommend diversifying the learning and teaching methods, especially with regard to student-centred techniques.
21. The experts strongly recommend revising the teaching and assessment methods to ensure that all course-level ILOs can be achieved.
22. The experts recommend making crucial regulations and procedures, such as the student complaint procedure, more transparently and readily available to students.
23. eFE & ePCE: The exams in the advanced programmes must be provided entirely in English if they are designated as English-language degree programmes.
24. It is recommended to implement systematic data collection and analyses on admission cohorts to evaluate and refine admission procedures.
25. The panel recommends introducing more tailored support mechanisms, such as counselling or flexible credit recovery plans, to address diverse student needs.
26. HUST must implement competence-based credit recognition in line with the Lisbon Recognition Convention to streamline credit transfer and enhance mobility.
27. HUST must revise the Diploma Supplement of all programmes under review to increase international comparability. This includes providing detailed information on learning outcomes and programme structure.
28. ePCE: The experts recommend that HUST should continue their efforts to get approval to issue a distinct Diploma Supplement for the ePCE programme to reflect its specialised qualification.
29. HUST should develop a strategy to enhance the teaching staff in terms of both quantity and quality.
30. eFE & ePCE: The expert panel recommends implementing a structured programme to enhance the English language proficiency of the teaching staff.
31. It is recommended to develop a documented onboarding process for external/guest lecturers to ensure alignment with programme requirements.
32. The experts recommend expanding training programmes to include modern pedagogical methods and assessment techniques.
33. The panel recommends reviewing the workload allocation of the teaching staff to include time for curriculum updates and student mentoring.
34. It is recommended that HUST establishes measures to ensure that incoming international students gain easier access to information on support services at HUST in English.
35. Comprehensive and up-to-date information on the study programmes for all stakeholders should be presented in more detail on the available channels.
36. The availability, quality, scope, and clarity of English-language materials should be improved to address the needs of international students and stakeholders effectively, especially for the advanced programmes ePCE and eFE which are taught in English.