AQAS

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AKKREDITIERUNG VON
STUDIENGÄNGEN E.V.

FINAL REPORT

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

CLUSTER AUTOMOTIVE & MECHATRONICS

AUTOMOTIVE ENGINEERING (BACHELOR'S DEGREE)

MECHANICAL MACHINE MANUFACTURING (ENGINEER'S DEGREE)

MECHATRONICS ENGINEERING (BACHELOR'S DEGREE)

June 2025

Content

DECISION OF THE AQAS STANDING COMMISSION

ON THE STUDY PROGRAMMES

- **"AUTOMOTIVE ENGINEERING" (BACHELOR'S DEGREE)**
- **"MECHANICAL MACHINE MANUFACTURING" (ENGINEER'S DEGREE)**
- **"MECHATRONICS ENGINEERING" (BACHELOR'S DEGREE)**

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 discussions of the AQAS Standing Commission in its 25th meeting on 19 May 2025, the AQAS Standing Commission decides:

I. Mechatronics Engineering (Bachelor's degree)

1. The study programme **"Mechatronics Engineering"** (Bachelor's degree) offered by Hanoi University of Science and Technology, Vietnam, is accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master). The study programme complies with the requirements defined by the criteria and thus the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version.
2. The accreditation is given for the period of six years and is valid until 31 May 2031.

II. Automotive Engineering (Bachelor's degree) and "Mechanical Machine Manufacturing" (Engineer's degree)

1. The study programmes **"Automotive Engineering"** (Bachelor's degree) and **"Mechanical Machine Manufacturing"** (Engineer's degree) offered by Hanoi University of Science and Technology, Vietnam, are accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master).
2. The accreditation is conditional.
3. 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.
4. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later than 31 May 2026. The confirmation of the conditions might include a physical site visit within the time period of twelve months.
5. The accreditation is given for the period of six years and is valid until 31 May 2031, provided that the conditions listed below are fully met. Otherwise, the accreditation may be withdrawn.

Conditions:

For the study programme “Automotive Engineering”:

1. In order to sharpen the profile as well as to highlight the distinction between the study programme and other engineering programmes, the following is required:
   a. More specific and current topics on automotive engineering (e.g., new EV technologies and digital topics) must be integrated into the curriculum.
   b. The titles of currently vaguely named courses must be modified to reflect the main topic of those courses more precisely.

For the study programme “Mechanical Machine Manufacturing”:

1. More specialised knowledge and management methods, especially quality management, must be integrated into the curriculum of the study programme.
2. The newly developed curricular structure must be submitted to ensure that the quality and ILOs of the study programme remain unchanged despite the reduced study duration from five to four years or eight semesters.

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

For all study programmes:

1. The duration of the internship should be extended from five weeks to three to six months and become a standard for all study programmes in order to allow students more time to adapt to practical tasks and gain hands-on experience.
2. To facilitate the suggested prolonged internship (3–6 months), it is recommended that the university fully optimises the use of blended learning by incorporating more online modules.
3. The university should establish an institutional mechanism such as an industrial advisory committee to engage industry representatives into formal dialogues with the university and the faculty.
4. It is recommended to thoroughly investigate and document the reasons for student dropout of all study programmes to address the issues with more effective measures.
5. The university should develop a long-term action plan to increase the number of guest lectures delivered by international academics.

For the study programme “Automotive Engineering”:

1. Regarding the supporting tools and software for students, it is recommended to further intensify the use of CAE-driven simulation, design, and R&D software tools to train students with more state-of-the-art tools and to make the use of 3D CAD mandatory for all students of this programme.
2. The engagement and exchange with the growing industry in Vietnam should be intensified and partnerships for acquiring additional hardware in the field of automotive engineering should be sought.

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

EXPERTS' REPORT

ON THE STUDY PROGRAMMES

- **"AUTOMOTIVE ENGINEERING" (BACHELOR'S DEGREE)**
- **"MECHANICAL MACHINE MANUFACTURING" (ENGINEER'S DEGREE)**
- **"MECHATRONICS ENGINEERING" (BACHELOR'S DEGREE)**

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

Visit to the university: 12-14 February 2025

Panel of experts:

Prof. Dr.-Ing. Frank Herrmann	Cologne University of Applied Sciences, Faculty of Automotive Systems and Production (Germany)
Prof. Dr.-Ing. Jürgen Mallon	Kiel University of Applied Sciences, Dean of Faculty of Mechanical Engineering (Germany)
Assoc. Prof. Dr. Nguyen Duy Anh	Ho Chi Minh City University of Technology, Department of Mechatronics (Vietnam)
Mr. Nhat Le	Bosch Vietnam, Senior Production Engineer (Ho Chi Minh City/Vietnam) (representative of the labour market)
Mr. Dominik Kubon	Student of RWTH Aachen, Electrical Engineering (Germany) (student expert)

Coordinator:

Ronny Heintze	AQAS, Cologne, Germany
Vi Le	

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 **"Automotive Engineering" (Bachelor's degree)**, **"Mechanical Machine Manufacturing" (Engineer's degree)**, and **"Mechatronics Engineering" (Bachelor's degree)** offered by **Hanoi University of Science and Technology, Vietnam**.

1. Criteria

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

AQAS checked the SER regarding completeness, comprehensibility, and transparency. The accreditation procedure was officially initialised by a decision of the AQAS Standing Commission on 27 August 2024. The final version of the SER was handed in in November 2024.

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 December 2024. AQAS informed the university about the members of the expert panel and the university did not raise any concerns against the composition of the panel.

Preparation of the site visit

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

Site visit

After a review of the SER, a site visit to the university took place from 12-14 February 2025. On site, the experts interviewed different stakeholders, e.g. representatives of the management of the higher education institution, the programme management, of teaching and of other 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 19 May 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 June 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 initially 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 41 units under Hanoi University of Science and Technology, including: 13 academic units, 6 research units, 12 administrative units, and 8 service units.

As of 2022, HUST employed 1,701 staff members, including 1,078 lecturers, 10 researchers, 458 administrative and service staff, and 155 technical staff. Among the lecturers, 814 hold doctoral degrees, representing 75.5% of the total teaching faculty. HUST offers a wide range of undergraduate and graduate programmes, including Bachelor of Science (4 years), Master of Science (1,5 years), Specialised Engineering (1,5 years), and PhD programmes, as well as a continuing education system for lifelong learning. As of 2024, the university has 37,709 full-time students, with a student-to-lecturer ratio of 33.81.

As stated in the SER, the mission of Hanoi University of Science and Technology is “human development, high-quality education, scientific research, technological innovation and knowledge transfer for the betterment of our nation and society”. HUST’s vision to 2030 is to become the leading research university in which engineering, and technology are at the core of the university and to contribute to the development of the knowledge economy, peace and security, and Vietnam’s higher education.

HUST’s total revenue in 2023 amounts to VND 1,760.7 billion (approximately USD 73 million). The majority, 63%, is generated from tuition fees, followed by contributions from businesses (14.3%) and the state budget (11.4%). Additional revenue streams include services, training partnerships, research, and sponsorships. The funds are distributed primarily towards payroll (44%), facilities (33%), professional development (7%) – covering per diem, staff training, and professional activities and learner support activities (6%).

School of Mechanical Engineering (SME)

The School of Mechanical Engineering was founded in 2021 as a merger of three existing schools, namely the School of Mechanical Engineering, the School of Vehicle and Energy Conversion Engineering, and the School of Heat Engineering and Refrigeration. The School of Mechanical Engineering (SME) consists of four departments responsible for teaching activities, three centres focused on practical training, experiments, and research, and an Administration Office. The school has 259 teaching and administrative staff, over 85% of 209 teaching staff holding doctoral degrees, and 57 associate professors and 9 professors. Annually, there are nearly 2,000 new students enrolled in this school, and the current student body is around 10,000 students, as of 2024.

There are six majors and 13 training programmes offered by the SME. The study programmes to be accredited are Automotive Engineering (Bachelor’s degree), Mechatronics Engineering (Bachelor’s degree) – a joint programme between HUST and Leibniz Hannover University (Germany), and Mechanical Machine Manufacturing (Engineer’s degree) – a joint programme between HUST and Griffith University (Australia).

IV. Assessment of the study programmes

1. Quality of the curriculum

Bachelor's/Master's degree

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

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

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

[ESG 1.2]

General aspects

It is stated in the SER that the ILOs of the three study programmes are in accordance with the Vietnamese National Qualifications Framework level 6 and the European Qualifications Framework EQF level 6, divided into three categories: knowledge, skills, and level of autonomy and responsibility. All three study programmes offer general compulsory courses in maths and basic science, physical education, political theory and law in their curriculum as required in the national training framework and the university's training regulations.

Since 2007, HUST has adopted a credit-based system, with training periods ranging from 4 to 7.5 years. Each credit is equivalent to 45 hours of learning, including self-study time. For classroom, one credit equates to a minimum of 15 hours of lectures or 30 hours of practical work, experiments, and discussions; 45 hours of work placements; or 45 hours dedicated to written assignments, major projects, or a graduation thesis. Additionally, one week of full-time project work corresponds to 1 credit, while one week of full-time internship is worth 0.5 to 0.6 credit. Most courses carry 1 to 4 credits, except for some courses such as internships, Bachelor's degree project/thesis (6 credits), and theses. An academic year consists of two main semesters and an optional summer semester. Main semesters last 20 weeks, with study periods divided into 8-week terms or a full 16-week period. The summer semester, lasting 5 weeks, is optional.

Automotive Engineering (Bachelor's degree)

Description

According to the SER, the intended learning outcomes (ILOs) of the Automotive Engineering programme are designed in consultation with the representatives of lecturers in the field and relevant stakeholders. The ILOs are listed as follows:

- Ability to apply knowledge of underlying mathematics and basic sciences to participate in design automotive engineering systems;
- Ability to use core engineering fundamental knowledge to participate in analysing automotive engineering systems;
- Ability to use advanced engineering fundamental knowledge, methods and tools to participate in designing and analysing systems in the automotive engineering field;
- Engineering reasoning and problem solving;
- System thinking;
- Perseverance and flexibility;
- Experimentation and knowledge discovery;

- Professional ethics, integrity and responsibility;
- Curiosity and lifelong learning;
- Teamwork: forming effective teams, team operation;
- Communication: written communication, electronic/multimedia communication, oral presentation and interpersonal communication;
- Communication in foreign languages: at least 500 TOEIC score;
- Conceiving, designing, implementing and operating systems in automotive engineering field in enterprises and societal context;
- Conceiving and enabling to participate in project developing in automotive engineering;
- Participate in designing systems in automotive engineering;
- Participate in implementing and operating systems/processes/products/technical measures in automotive engineering;
- Political theory qualifications in line with general programmes and regulations of the Vietnam Ministry of Education and Training;
- Physical Education Certificate and Civil Service Education Certificate in line with general programmes and regulations of the Vietnam Ministry of Education and Training.

The SER outlines the intended learning outcome matrix connecting the ILOs of the programme to the learning outcomes of each course.

It is stated in the SER that graduates of the programme have a wide range of career opportunities. They can work in project management within automobile manufacturing companies or technical service providers related to the automotive industry. They may also specialise in testing and quality assurance of automotive products, from evaluating small components to assessing the overall quality of finished vehicles. Japan, in particular, offers significant job prospects for graduates in design and component manufacturing. Some graduates may choose to further their education with a master's degree to enhance their knowledge and professional abilities. Additionally, outstanding students can pursue careers as lecturers or trainers in universities, vocational training centres, or other organisations focused on automotive engineering.

The curriculum of the programme comprises 8 semesters and consists of three main knowledge blocks: mathematics and basic science (24% or 32 credits), basic and core of engineering block (35% or 46 credits), and elective-oriented courses (14% or 18 credits). 13 credits (10%) are allocated to courses on political theory and law, while English courses and courses on skills account for 6 credits (4.5%) and 9 credits (7%), respectively. The Engineering practicum and Bachelor's thesis amount to 8 credits (6%).

In the first semester, students undertake foundational courses such as Philosophy of Marxism and Leninism I, English 1, Calculus I, Physics I, Algebra, and Introduction to Automotive Engineering. The second semester includes Philosophy of Marxism and Leninism II, English 2, Calculus II, Physics II, Introduction to Computer Science, and Introduction to Mechanical Engineering. In the third semester, students study Scientific Socialism, Calculus III, Physics III, Probability and Statistics, Experimental Programming, Engineering Graphics I, Engineering Mechanics I, and Fundamentals of Electrical Engineering. The fourth semester covers the History of the Vietnamese Communist Party, Fluid Engineering, Engineering Graphics II, Engineering Mechanics II, Strength of Materials, Theory of Machine and Mechanism, and Electronic Engineering. During the fifth semester, students take courses such as Ho Chi Minh's Thought, Hydrodynamic Machines, Machine Element Design, Tolerances and Measurement Techniques, Thermodynamics, Materials Science, Structure of Internal Combustion Engines, Automobile Structures, and Introduction to Management. The sixth semester focuses on Manufacturing Technology, a Design Project, Fundamentals of Internal Combustion Engines, Theory of Automobiles, Automobile Electronics, Applied Psychology, and Technical Writing and Presentation. The seventh semester is dedicated to specialised courses such as Automobile Maintenance and Repair, Module 1:

Automobile Design and Calculation, Chassis-Frame Technology, Module 2: Vehicle Propulsion Systems and Design of Automobile Engines, and Business Culture and Entrepreneurship. In the final semester, students are required to complete an Engineering Practicum and a Bachelor's thesis. In addition to these core courses, students must complete Military Education courses during the first three semesters, covering topics such as the Vietnam Communist Party's Direction on National Defence, Introduction to National Defence, and General Military Education. From the fifth to seventh semester, student can choose elective courses on soft skills for 9 credits as well as courses on physical education for 5 credits.

It is stated in the SER that the curriculum incorporates 12 courses with experiments, making up 15% of the time allocated to each course. Additionally, students must complete a project within this block. Students are required to complete a five-week engineering internship at a company or factory. These internships are said to be designed in collaboration with industry partners to provide an authentic experience in real-life industrial settings.

Experts' evaluation

The intended learning outcomes (ILOs) formulated in the SER fully present the desired qualifications to be achieved. Several ILOs focus on subject specific topics like being able to participate in designing, analysing or project development of automotive engineering systems. 18 credits of elective courses are exclusively related to automotive engineering. Interdisciplinary elements are covered by a number of courses related to the fields of soft skills, political theory, and general law. All curricular elements such as ILOs, course/module descriptions, as well as compulsory and elective courses, are well-documented. An idealised typical course plan is also available. The total programme workload is correctly allocated to the different courses/modules and confirmed to be manageable for students.

Academic requirements as well as labour market requirements are generally reflected by the intended learning outcomes. Labour market representatives acknowledged that the 8-semester Bachelor's programme suits the needs of the industry. Regarding the duration of the internship, it was clearly pointed out by students and labour market representatives that the current duration of 5-7 weeks is not sufficient. Therefore, an internship of three to six months would be beneficial for the students and the industry and should become a standard for all Bachelor's programmes **(Finding 1)**. The appropriateness of the programme seems to be well-monitored by the stakeholders (e.g., students and industry). Evaluation by students and a large network of alumni providing feedback on the programme and the curriculum ensures the feedback loop to be closed.

The curricular structure of the programme shows a complete and extensive set of courses and supports the achievement of the intended learning outcomes and learners' progression. In the discussions during the site visit, the experts learnt that a number of interesting and innovative topics on specialised knowledge in automotive engineering is offered in the later semesters of the programme. However, the current 14% for specialised courses of total courses seem to be proportionately inadequate in comparison to the whole curriculum. In order to sharpen the profile as well as to highlight the distinction between this programme and other engineering programmes, it is crucial to integrate more specific and current topics on automotive engineering (e.g., new EV technologies and digital topics) into the curriculum **(Finding 2a)**. Along this line, the title of many courses must be modified to reflect the main topic of those courses more precisely **(Finding 2b)**. For example, the content of the course "Theory of Automobile" strongly relates to the matter of "Vehicle Dynamics", while the course "Chassis-Frame Technology" actually refers to the matter of "Body Engineering".

Regarding the supporting tools and software, it would be beneficial for students to further intensify the use of CAE-driven simulation, design, and R&D software tools; to train students with more state-of-the-art tools such as Siemens NX (including Simcenter 3D Academic bundle) and MATLAB Simulink through electives; and to make 3D CAD mandatory for all students of this programme **(Finding 3)**. This will bring the two labs with 40

high-configuration computers visited during the site visit to an optimal use and catch up with the international research and development in automotive engineering.

The process for curricular modifications at SME is scheduled every two years for minor changes and every five years for major changes. As the programme was launched in 2020, the upcoming revision in 2025 would be feasible for suggested modifications.

Conclusion

The criterion is partially fulfilled.

Mechanical Machine Manufacturing (Engineer's degree)

Description

The Mechanical Machine Manufacturing programme is said to be established and developed based on the cooperation between HUST and Griffith University, Australia. According to the SER, the intended learning outcomes (ILOs) of the programme are designed based on the guidance on developing ILOs according to the CDIO (Conceive, Design, Implement, Operate) level 2 and the benchmarking with programmes and ILOs of similar majors at home, abroad, and in Griffith University. The ILOs are listed as follows:

- The ability to apply knowledge of mathematics and basic science to design and calculate mechanical systems / processes / products;
- The ability to apply the background knowledge of the field to perform an analysis on mechanical systems / processes / products;
- The ability to apply core knowledge of the field, combined with the capability to exploit and use modern methods and tools to participate in the design and evaluation of mechanical engineering systems / processes / products;
- The ability to apply core knowledge of the field to explore, design, develop, and lead the operation of mechanical production systems/processes;
- Skills in detecting, analysing and solving problems in mechanical engineering field;
- Skills in systematic and critical thinking;
- Dynamism, seriousness, and perseverance;
- The ability to experiment, explore knowledge, and conduct research and development;
- Ethics and professional responsibilities;
- An understanding of contemporary issues and lifelong learning;
- Skills in collaboration, organization, and teamwork;
- Communication skills through writing, presentations, discussions, effectively utilising modern tools and media;
- Skills in using English at work according to the regulations of the university;
- Awareness on the close relationship and the influence of technology solutions in mechanical engineering to economic, social and environmental factors in a globalised world;
- The ability to identify problems and to form ideas of technical solutions; the ability to participate in project settings related to mechanical engineering;
- The ability to design mechanical systems / processes / products / solutions;
- Ability to implement / manufacture / exploit mechanical systems / processes / products / technical solutions;
- Political theoretical qualifications under the general regulations programme of the Ministry of Education and Training;

- Physical education certificate and certificate of national defence and security according to the regular for the general Bachelor's programme from the Ministry of Education and Training.

The SER outlines the intended learning outcome matrix connecting the ILOs of the programme to the learning outcomes of each course covering knowledge, skills, and attitudes.

As stated in the SER, graduates have various career paths, including roles as mechanical engineers, machine manufacturing technicians, product design and development engineers, equipment operation experts, system maintenance specialists, and production line managers. They can also pursue careers as lecturers or researchers in academic and research institutions, with a strong emphasis on product design and development engineering. Additionally, in countries like Japan, graduates can work as design engineers, equipment operation engineers, researchers, or technical specialists, particularly in international projects and services related to mechanical and machine manufacturing. The programme also offers students the opportunity to transfer their studies after two years at HUST and complete their degree at Griffith University.

The curriculum of the programme comprises 10 semesters with a total of 159 credits and consists of three main knowledge blocks: mathematics and basic science (19.5% or 31 credits), basic and core of engineering block (36% or 57 credits), and courses on specialised knowledge (16% or 26 credits). 13 credits (10%) are allocated to courses on political theory and law, while English courses and elective courses account for 6 credits (4.5%) and 9 credits (7%), respectively. Engineering internship and Engineering thesis amount to 14 credits (9%).

In the first semester, students take foundational courses such as English 3, Calculus I, Physics I, Algebra, and Introduction of Informatics. The second semester includes English 4, Calculus II, Physics II, Materials Science, Introductory Mechanical Engineering, and Introduction to Management. In the third semester, students study Fundamental Principles of Marxism-Leninism I, Calculus III, Computing and Programming with MATLAB, Engineering Mechanics I, Strength of Materials, Theory of Machines, Plastics and Composite, and Engineering Graphics I. The fourth semester covers Fundamental Principles of Marxism-Leninism II, Engineering Graphics II, Electronic Engineering, Thermal Engineering, Engineering Mechanics II, Strength of Materials II, Machine Element Design, and Introduction to Mechanical Engineering. During the fifth semester, students take courses such as Ho Chi Minh's Thought, Electrical Engineering, Measurement Techniques, Principle of Metal Cutting, Project of Machine Design, Machine Tools, Workshop Practice, Workpiece Fabrication, and Presentation Techniques. The sixth semester focuses on Revolution Policy of Vietnam Communist Party, Hydrodynamics, Cutting Tool Design, Manufacturing Technology, Sensor and Signal Conditioning, and Introduction of Legal Environment. The seventh semester is dedicated to specialised courses such as CNC Processing Techniques, Jigs and Fixtures, Project of Cutting Tool, Machine Tool Design, CNC Machine Tools and Industrial Robot, Engineering Practicum and elective courses for 6 credits. The eighth semester offers Safety Techniques Environment, Mechanical Engineering Design, Control System, Project of Machine Tool Design, Project Machining Technology, Creative Engineering, and elective courses for 4 credits. During the ninth semester, students take Automation Control Engineering, elective courses for 2 credits, and Engineer Internship. The final semester is dedicated to a Bachelor's thesis for 9 credits. In addition, students must complete Military Education courses during the first three semesters, covering topics such as the Vietnam Communist Party's Direction on National Defence, Introduction to National Defence, and General Military Education. Elective courses and physical education courses are said to be organised with flexibility.

According to the Vietnamese National Qualifications Framework, programmes ranging from 120 to 180 credits with ILOs equivalent to level 6 are classified as Bachelor's level. Despite the duration of 10 semesters, the Engineer's programme in Mechanical Machine Manufacturing (International Cooperation Academic Programme) is designed with 159 credits and has undergraduate ILOs; therefore, it is categorised as level 6 in the VQF.

Experts' evaluation

Based on the SER as well as the discussion during the site visit, the experts evaluate that the intended learning outcomes are well-developed in cooperation with the partner Griffith University and the industry representatives, aligning with the Vietnamese National Qualifications Framework (VQF) level 6 as well as the European Qualifications Framework (EQF) level 6.

During the discussion, the industry representatives seemed to be satisfied with the graduates from this study programme. However, there is still room for improvement to better bridge the gap between theoretical knowledge learnt at university and practical expertise acquired in the professional world. In this context, the duration of the internship should be extended from the current five weeks to three to six months to allow students more time to adapt to practical tasks and gain hands-on experience **(see Finding 1)**. This extension is also in line with the expectation of students and labour market representatives.

The curriculum is well-designed and regularly revised to support the achievement of the intended learning outcomes. Yet, the management knowledge and skills needed for the career path as production engineer is not sufficient from the experts' perspective. Other specialised knowledge such as quality management, lean management, six sigma and PLM delivered in a 3-credit course has not been adequately embedded in the curriculum. Therefore, it is crucial to integrate more specialised knowledge and management methods, especially quality management, into the curriculum in the next curricular revision **(Finding 4)**.

As stated above, the curriculum of the 10-semester Engineer's programme in Mechanical Machine Manufacturing and the intended learning outcomes are aligned with the VQF level 6 and EQF level 6 – the Bachelor's level. The duration, however, does not correspond to the international standard for a Bachelor's programme. It was explained to the experts during the site visit that before 2020, all Engineer's programmes (designed with 10 semesters) at HUST as well as other universities in Vietnam awarded an Engineer's degree, which is equivalent to VQF level 6. In recent years, there has been a new regulation from the Ministry of Education and Training to shorten the duration of these programmes to eight semesters in order to better align with the international standards. The management of the faculty and the study programme also informed the experts that the curriculum for an eight-semester programme was currently being developed for admission in 2025, strictly adhering to the existing programme structure and content. The experts found this approach both reasonable and feasible. Therefore, the panel emphasised that the updated curriculum must be submitted to ensure that the quality and ILOs of the study programme remain unchanged despite the reduced study duration **(Finding 5)**. Based on the initial discussions on site this process is already in that advanced steps as it is about to be implemented in 2025 and the key elements were discussed during the interviews.

Conclusion

The criterion is partially fulfilled.

<u>Mechatronics Engineering (Bachelor's degree)</u>

Description

The Mechatronics Engineering programme is an international joint programme in cooperation with Leibniz Hannover University, Germany. According to the SER, the intended learning outcomes (ILOs) of the programme are designed based on the guidance on developing ILOs according to the CDIO (Conceive, Design, Implement, Operate) level 2 and in consultation with relevant stakeholders. The ILOs are listed as follows:

- The ability to apply basic mathematical and scientific knowledge to participate in the design and calculation of mechatronic systems / processes / products;

- The ability to apply the basic knowledge of the discipline to participate in the analysis of mechatronic systems/processes/products;
- The ability to apply the core knowledge of the discipline combining the ability to exploit and use modern methods and tools to participate in the design and evaluation of M&E solutions/systems/processes/products;
- Analysing skills;
- Skills systematic and critical thinking;
- Activeness, seriousness, perseverance;
- Ability in discovering the knowledge and practical implementation;
- Ethics and professional responsibilities;
- Understanding contemporary issues and lifelong learning;
- Skills for cooperation, organisation and teamwork;
- Communication skills through writing, presentation, discussion, effectively using of modern tools and media;
- Skills in using German at work by getting B1 level (B2 level for exchange programme) according to the regulations of the university;
- Participate in the process of design, simulation, and deployment of a Mechatronic system;
- Join the hardware manufacturing process;
- Join the software deployment process;
- Participate in inspection, verification, approval and certification;
- Awareness on the close relationship and influence of Mechatronic technical solutions to economic, social and environmental factors in the context of globalisation;
- The ability to identify problems and form ideas of technical solutions, the ability to participate in the construction of projects related to mechatronics;
- Having political theoretical qualifications under the general regulations programme of the Ministry of Education and Training;
- Having a physical education certificate and certificate of national defense and security according to the regular for the general Bachelor's programme from the Ministry of Education and Training.

The SER outlines the intended learning outcome matrix connecting the ILOs of the programme to the learning outcomes of each course covering knowledge, skills, and attitudes.

The duration of the study programme is 8 semesters or 4 years with a workload of 145 credits in total. The basic and core knowledge blocks make up 32% (47 credits), while the basic math and science knowledge blocks account for 22% (32 credits). Besides English courses with 6 credits, students dedicate 9% of their time to studying German (13 credits). Supplementary skills, which are essential for career development, represent 6% of the curriculum (9 credits). Additionally, each student must complete the political theory and law knowledge block, which constitutes 9% of the curriculum (13 credits), as mandated by the Ministry of Education and Training. As an international joint programme with Leibniz University Hannover, Germany, students of this programme who complete their third year have the opportunity to participate in a one-year exchange at Leibniz University Hannover. To qualify, students must meet the B2 German language requirement. After completing the exchange, they return to HUST to finish their programme. Students are required to complete elective-oriented courses with 17 credits as well as an engineering practicum and Bachelor's thesis with 8 credits.

In the first semester, students undertake foundational courses such as Philosophy of Marxism and Leninism, English 1, German 1 Calculus I, Physics I, and Algebra. The second semester includes Political Economics of Marxism and Leninism, General Law, English 2, German 2, Calculus II, and Introduction of Computer Science. In the third semester, students study Scientific Socialism, German 3, Calculus III, Physics II, Calculation

Methods and Matlab, Engineering Graphics I, Engineering Mechanics I, and Strength of Materials I. The fourth semester covers the Revolution Policy of the Vietnamese Communist Party, German 4, Introduction to Manufacturing Engineering, Engineering Graphics II, Electrical Engineering, Electronic Engineering, Engineering Mechanics II, Strength of Materials II, and Practical Workshop. During the fifth semester, students take courses such as Ho Chi Minh's Thought, Introduction of Mechatronics Engineering, Theory of Machines, Automation Control Theory, Materials Science, Data Structures and Algorithms, Thermal Engineering, Sensor and Signal Processing, and Finite Element Method. The sixth semester focuses on Machine Element Design, Measurement Techniques, Manufacturing Technology, Robotics, Programming Engineering in Mechatronics, Fluid Engineering, Fundamental of CNC Machines, and Applied Psychology. The seventh semester is dedicated to specialised courses such as Microprocessor, Mechanical Design Project I, Human Machine Interface, Image Processing in Mechatronics, Networked Control Systems, Introduction to Management, Soft Skills, and Technical Writing and Presentation. In the final semester, students are required to complete an Engineering Practicum and a Bachelor's thesis. In addition to these core courses, students must complete Military Education courses during the first three semesters, covering topics such as the Vietnam Communist Party's Direction on National Defence, Introduction to National Defence, and General Military Education. From the fifth to seventh semester, student can choose elective courses on soft skills for 9 credits as well as courses on physical education for 5 credits.

The curriculum also includes two courses that are entirely practical: the Practical Workshop, conducted in a practice workshop, and the Engineering Practicum, which involves a five-week placement at companies and factories within the specialised field of training.

Experts' evaluation

The Mechatronics Engineering training programme is structured with clearly defined intended learning outcomes (ILOs), integrating specialised and interdisciplinary knowledge. Students are equipped with a solid foundation in mathematics, engineering sciences, systematic thinking, teamwork, and professional responsibility. The programme requires German language proficiency at level B1 (B2 for exchange students), providing a competitive advantage in an international environment.

Designed according to the CDIO framework at level 2, the curriculum enables students to acquire theoretical knowledge and apply it to practical Mechatronics systems. Courses such as Machine Element Design, Automatic Control, Robotics, and Image Processing are continuously updated to align with modern technological advancements. A team of young, dedicated lecturers, combined with an active alumni network, ensures that the programme remains closely aligned with industry demands. Alumni actively support students through internships, thesis supervision, job fairs, and employment opportunities.

The programme spans eight semesters, adhering to the Vietnamese National Qualification Framework (VQF) and the European Qualifications Framework (EQF) level 6. Graduation requires the completion of a thesis, demonstrating students' attainment of learning outcomes. The curriculum is well-structured, allocating 22% of credits to mathematics and fundamental sciences and 32% to specialised courses, along with soft skills and social science modules to ensure comprehensive student development.

The balance between theory and practice is reinforced through practical workshops and technical internships. However, further assessment of the effectiveness of internships in preparing students for the job market should be taken into account. The experts therefore recommend extending the duration of the internship to three to six months **(see Finding 1)**.

Overall, the programme aligns well with practical requirements, facilitating the students' integration into an international environment. The dedication of the faculty and the support from alumni contribute to enhancing the quality of education. Continuously gathering feedback from businesses and alumni is essential to

maintaining the programme's relevance and up-to-date content, which has been well implemented so far. Additionally, proper attention should be given to record-keeping to ensure data can be readily retrieved for various purposes.

Conclusion

The criterion is fulfilled.

2. Procedures for quality assurance

Bachelor's/Master's degree

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

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

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

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

[ESG 1.1, 1.7 & 1.9]

Description

According to the SER, HUST has prioritised "training quality first" by implementing 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, aligning with the UN Sustainable Development Goal of ensuring inclusive, quality education. In 2024, HUST stated to have issued a new quality policy focused on internationalisation, innovation, and digital transformation, in line with the ISO 21001:2018 standards.

HUST's quality management system is structured into 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, SWOT analysis for strategic planning, and using accreditation results for continuous improvement.

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 School of Mechanical Engineering (SME) has established a Quality Assurance Group (QAG) to manage these tasks, ensure transparency, and report annually on QA outcomes. The QAG comprises the Vice Dean in charge of Training and Accreditation, ISO staff, Programme Directors, academic group leads, and the School Office Secretary. The QAG is responsible for preparing legal documents and guidelines for internal QA activities, submitting them for approval, and guiding their implementation within SME. These documents are communicated to staff, students, and alumni through class meetings, seminars, and the SME website, covering topics such as QA of recourses, achievements of external accreditation, and improvement of the SME Office.

As stated in the SER, HUST employs various tools to monitor its quality management system, including the Department of Inspection, Legal, and Internal Audit, which checks compliance with university regulations. At

the end of each semester, HUST surveys learners for feedback via a QA information system. Surveys are also said to be conducted with different stakeholders, such as students, graduates, lecturers, staff, alumni, and employers.

HUST is said to collect and analyse data from various activities, including training, research, technology transfer, and support services. This data is gathered through information systems accessible to students, lecturers, and managers, enabling efficient tracking and monitoring. Additionally, HUST and SME collect external data from sources such as state agencies, professional associations, and regular alumni meetings. Information on labour market needs is also gathered through job fairs, surveys, and alumni connections, as stated in the SER.

Experts' evaluation

Based on the SER and the discussions during the site visit, the experts gained a good impression that HUST had a solid and well-operated QA system. Extensive data collection involving all stakeholders is functioning effectively, leading to meaningful adjustments in the curriculum, workload, and course content. As aforementioned, during the discussion with industry representatives, the wish for longer internships was highlighted. The extension of the internship to three to six months would be beneficial for students and greatly contribute to the quality enhancement in aligning the curriculum with industrial needs (see Chapter 1, Finding 1).

Internal communication within the faculty is well-structured, relying on information provided by the Quality Assurance Group (QAG). This has been demonstrated through the strong alignment of statements from staff members. The close monitoring of student learning progress and the support measures provided by lecturers and academic advisors serve as strong examples of the effectiveness of the quality management system.

The selection of young lecturers is a profound process leading to impressive results. The experts highly evaluate the supervision and support which is provided during their first year to ensure that these young lecturers adapt smoothly to their new roles.

In addition, the university has an extensive network of alumni and industry representatives which provide the study programmes with current insights on the industrial needs and opportunities for students in terms of internship. The experts believe that this is a valuable resource which should be utilised more effectively. Therefore, one suggestion is to establish an institutional mechanism such as an industrial advisory committee to engage the industry representatives into formal dialogues with the university and the faculty **(Finding 6)**.

The dropout rate of the study programmes is relatively high. Many reasons have been mentioned during the discussion to justify the situation, but not in a systematic way. Therefore, it is recommended to thoroughly investigate and document the reasons for student dropout to address the issues with more effective measures **(Finding 7)**.

Although the concept of preventing academic fraud was neither mentioned in the SER nor discussed with faculty members during the site visit, it is worth noting this for awareness that the university should have a concept with appropriate strategies in place to address any potential issues in this regard.

Conclusion

The criterion is fulfilled.

3. Learning, teaching and assessment of students

Bachelor's/Master's degree

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

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

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

[ESG 1.3]

Description

According to the SER, the study programmes employ various teaching and learning methods including traditional methods such as lectures and presentations, active methods such as problem-based and group-based learning, blended-learning by combining in-class sessions with online learning, and experiential learning. Specific teaching and learning activities can be named as lectures, tutorial, exercises and homework, class discussion, hand-on practice and experiment report writing, peer-review, problem-based learning, project-based learning, teamwork, videoclip making, self-learning and self-reflection, etc. The university also states in the SER that teaching methods are customised to specific groups of students, namely full-time students, part-time students, international students, and students with disabilities.

In terms of study organisation and feasibility, the university states in the SER that the total learning volume and courses adhere to standard curriculum frameworks, allowing students to either complete their studies within the standard timeframe or accelerate for early graduation. The curriculum is said to be structured to maintain student engagement, starting with introductory and basic engineering courses in the early semesters, followed by main semesters offering 20 to 25 credits to support timely completion. Internships and graduation projects are scheduled for the summer and final terms. In addition, graduates from these study programmes can transition directly to MSc studies after graduation, completing the degree in an additional 1.5 years. Starting in 2024, students who finish their bachelor's degree can also pursue a specialised engineering degree, requiring an additional 60 credits over 1.5 years, according to the SER.

Assessment methods of students are said to be varied depending on the course objectives and contents, including written exams, oral exams, thesis defence, tests, and some other exams like international tests of English. As stated in the SER, the university publishes its annual study plan and exam schedule, specifying exam times, locations, and methods to communicate the result. Exam schedules, based on course outlines, are available online, on bulletin boards, and via emails, as stated in the SER.

Midterm and final exams are graded on a 10-point scale, with scores rounded to 0.5 points. A course grade combines midterm and final grades, rounded to two decimal places and converted to letter grades. 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 exempts foreign students from Civil Service Education and students with disabilities from physical education. Students with disabilities are also provided with separate exam rooms, additional time, support tools, and assistance with travel and accommodation during exams. However, in the past five years, the three programmes have not had any students with special needs during exam periods.

The SER also states that in addition to academic assessments, students are evaluated on non-academic performance, with a maximum score of 100, which contributes to scholarship considerations and personal development. Non-academic assessment is conducted via an online tool, coordinated by various university

departments. Evaluation criteria include academic performance, discipline, participation in extracurricular activities, civic awareness, and any penalties for violations.

Experts' evaluation

The TE1, ME-GU, and ME-LUH programmes at Hanoi University of Science and Technology (HUST) provide a well-structured, student-centred learning environment through a combination of traditional lectures, active learning and teaching methods, and industry-relevant training. Overall, teaching methods are well-aligned with intended learning outcomes (ILOs), ensuring that students acquire the necessary knowledge, skills, and competencies required in the industry. Especially, the curricula are logically structured from basic to advanced courses, ensuring a progressive learning experience. The programmes integrate problem-based learning, project-based learning, group-based learning, blended learning (B-Learning), and experiential learning to enhance student engagement. Therefore, the expert panel confirms that these approaches bridge the gap between academic learning and industry demands.

The programmes also offer various learning paths for different student groups, including full-time, part-time, and international students, as well as students with disabilities. Students also have the option for early graduation or direct transition to Master's programmes, providing flexibility in their academic and career paths.

Practical learning is highly emphasised through well-organised laboratory sessions, internship and industry collaborations. According to the site visit and the SER, the laboratory only allows for a maximum of 20 students per session, ensuring high-quality instruction and hands-on learning. To enhance practical learning, the programmes have reduced theoretical content, allowing more time for hands-on practice. Moreover, there are many joint research groups between students and faculty, which further enhance their relationship as well as innovation and technical expertise for students. Student and graduate feedback during the site visit revealed that they receive strong academic and mental support from faculty members whenever needed. The presence of dedicated lecturers who actively guide and mentor students significantly contributes to their overall academic success.

According to SER, assessment procedures are well-structured and transparent. The responsibilities for organising exams are clearly defined and made accessible through academic handbooks and online systems. Students can refer to course outlines detailing grading criteria, assessment types, and evaluation formats, ensuring clarity regarding academic expectations. Exam schedules are published well in advance through online platforms, department notice boards, and student emails. This early notification allows students to prepare effectively and manage their study time efficiently. Moreover, there are various assessment formats such as written exams, oral exams, practical lab assessments, project-based evaluations, and thesis defences in order to evaluate student competencies. Students are evaluated based on different skill sets, ranging from theoretical to technical knowledge, research ability, and problem-solving skills. Additionally, learning materials, assignments, announcements, and grades are accessible through the Student Information System (SIS) and the online training management system, allowing them to keep track of their academic progress effectively.

As previously mentioned, feedback from students and industry partners suggests that a longer internship period is necessary to allow students to engage with practical applications, develop problem-solving skills, and practical skills. To facilitate the prolonged internship, it is recommended that HUST fully optimise the use of blended learning by incorporating more online modules **(Finding 8)**. This would provide the students greater flexibility in managing their course work which, in turn, would allow for an extension of the internship duration to at least three months up to six months without delaying the academic progress of students. Students will gain the opportunity to fully integrate into company projects, more hands-on experience, and professional competencies.

Conclusion

The criterion is fulfilled.

4. Student admission, progression, recognition and certification

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

Description

Admission

The university states that from 2019 to 2024, there have been several innovations of the admission policy. As of 2024, there are three main paths for admission:

- *Admission based on the results of the high school graduation exam:* Candidates can apply to HUST using scores from various subject combinations, including A00 (Math, Physics, Chemistry), A01 (Math, Physics, English), D01 (Math, Literature, English), and D07 (Math, Chemistry, English). HUST also accepts international English certificates like IELTS or VSTEP (Vietnamese Standardised Test of English Proficiency), converting these into equivalent English test scores. For example, a VSTEP score of 5.0-5.5 converts to 8.5 points, while an IELTS score of 6.5 or higher converts to 10 points. This path admits about 50% of the quota.
- *Admission based on the results of the Thinking Skills Assessment test (TSA):* The TSA, similar to tests like the SAT or ACT, assesses candidates' overall thinking and reasoning abilities. In 2024, HUST will organise the TSA in six stages as computer-based multiple-choice tests, with result certificates valid for two years for use in applications to higher education institutions nationwide. This path admits about 30% of the quota.
- *Talent admission:* HUST's talent admission method evaluates candidates based on their academic profile and achievements. This includes applicants with high rankings in academic competitions or those holding international English certificates like IELTS (6.0 or higher) or VSTEP (B2 or above). Required documents include proof of academic results, research, language proficiency, and other achievements. This path admits about 20% of the quota.

HUST's talent admission method selects candidates based on their scores, from highest to lowest, until the allocated quota is filled. Successful candidates receive conditional admission, pending high school graduation, and must register their preferences on the Ministry of Education and Training's system. Applicants using TSA or National High School Examination results also need to register their preferences on this system. The system then automatically selects candidates for each HUST programme based on the quota (subtracting those already admitted through the talent method), the order of preferences registered by candidates, and select from highest to lowest scores until the quota is filled. For the Mechanical Machine Manufacturing programme, a minimum English proficiency of 4.5 IELTS or equivalent is required.

The SER also outlines admission rates of the cohorts of the whole university and each study programme in the past five years, the gender distribution of admitted students, as well as their academic performance after high school.

Progression

According to the SER, SME monitors and manages student progress and academic performance through a coordinated system that includes:

- *Student Information System (SIS)*: This system tracks student information, academic results, accumulated credits, GPA, and CPA. It also provides schedules and study plans, allowing both students and parents to monitor academic progress and receive early warnings about poor performance.
- *Software system supporting students' extracurricular activities*: Managed by the Department of Student Affairs, this system records extracurricular and community service activities to calculate non-academic performance scores.
- *Academic Advisory Board (AAB) and Class Managers*: Class managers, who are SME lecturers, oversee 40-60 students and monitor both academic and non-academic performance using SIS. They work with the AAB to support students, particularly those with academic warnings, ensuring they meet graduation requirements and transition smoothly into the workforce.

SME states that they also use various monitoring methods, including activities by the Youth Union, Student Union, and clubs, along with surveys and feedback, to track student progress.

Recognition and certification

HUST states in the SER that credits earned at HUST can be transferred internationally through the ECTS system. For instance, 1 theoretical credit equals 1.42 ECTS credits, 1 practical/laboratory credit is equivalent to 1.83 ECTS; 1 internship credit is equivalent to 2.2 to 2.67 ECTS; and 1 thesis/project credit is equivalent to 1.5 to 2.0 ECTS. Recognition can be done for individual courses or groups of courses. Students may also undertake thesis/dissertation at domestic or foreign institutions under student exchange programmes but must defend them at HUST for evaluation and grading. The maximum credit total that can be recognised and transferred does not exceed 50% of the total study programme credits.

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, providing information on the student's study and achievements, personal information such as name, birth date, enrolment date, and graduation date. For the Mechanical Machine Manufacturing programme, after the first two years, students have two options: continue for three more years at HUST to obtain an Engineer's degree or transfer for two years to the Australian partner university to obtain the partner university's degree. For the Mechatronics Engineering and Automotive Engineering programme, students completing the study programme and meeting the requirements for study load, GPA, CPA, and other regulations will be awarded a Bachelor's degree.

Experts' evaluation

HUST has a transparent and well-defined admission policy with three main pathways: high school graduation exam results, the Thinking Skills Assessment (TSA), and talent-based admission. The specific selection criteria, including subject combinations, English proficiency conversion, and quotas, are publicly available, ensuring fairness for applicants. The selection process follows standardised procedures through the Ministry of Education and Training's system.

The admission prerequisites for each study programme are aligned with academic requirements. For instance, the Mechanical Engineering programme mandates a minimum IELTS score of 4.5 to ensure adequate language proficiency. HUST regularly updates its admission policies to reflect current educational and industry needs.

The university systematically collects admission data from previous cohorts to assess and improve its policies. The SER includes statistics on admission rates, gender distribution, and academic performance after enrolment.

HUST adopts the European Credit Transfer and Accumulation System (ECTS) to facilitate international academic mobility. Students may complete their thesis at partner institutions but must defend it at HUST for official recognition. The maximum number of transferable credits is capped at 50% of the total programme credits to maintain academic integrity.

The university also promotes student mobility through learning agreements and exchange programmes. Certain disciplines, such as Mechanical Engineering, offer dual-degree programmes with partner universities in Australia, expanding international study opportunities.

Graduates receive a diploma, academic transcript, and diploma supplement in both Vietnamese and English, providing comprehensive details on their academic achievements according to the ECTS system. This ensures broad recognition of qualifications and enhances career and further study opportunities internationally.

Overall, HUST demonstrates a rigorous and structured approach to admission, academic progression, and recognition, adhering to national and international standards to support student development and global integration.

Conclusion

The criterion is fulfilled.

5. Teaching staff

Bachelor's/Master's degree
The composition (quantity, qualifications, professional and international experience, etc.) of the staff is appropriate for the achievement of the intended learning outcomes.
Staff involved with teaching is qualified and competent to do so.
Transparent procedures are in place for the recruitment and development of staff.
[ESG 1.5]

Description

As of 2024, HUST has a total of 1,690 staff, of which 1,066 are lecturers. 76.7% of the lecturers hold a PhD degree, and 25.1% of them own the title as professor or associate professor. As stated in the SER, lecturers are responsible for teaching, research, and participating in management and service activities. Their expected outcomes vary based on their job position, title, qualifications, and agreed workload allocation. The workload is calculated based on average weekly working hours, with time evenly distributed across their various responsibilities. In particular, lecturers are normally required to fulfil 18 hours of teaching, 18 hours of research, and 4 hours of service work/management in a week.

Lecturers at SME are assigned to four departments: Mechatronics Engineering, Mechanical Engineering, Vehicle and Energy Conversion Engineering, and Thermal Energy Engineering. Each department manages various training programmes. For example, the Department of Vehicle and Energy Conversion Engineering oversees the Automotive Engineering programme, while the Mechatronics Engineering and Mechanical Machine Manufacturing are managed by the Departments of Mechatronics Engineering and Mechanical Engineering, respectively. The number of lecturers engaged in each study programme following their titles and degrees is listed as below:

- Automotive Engineering: a total of 67 lecturers including 5 professors, 19 associate professors, and 43 lecturers, of which 79.1% are holding a PhD degree and the remaining having a Master's degree.
- Mechanical Machine Manufacturing: a total of 36 lecturers including 2 professors, 5 associate professors, 28 lecturers, of which 86.7% holding a PhD degree and the remaining having a Master's degree, and 1 invited professor/lecturer.
- Mechatronics Engineering: a total of 35 lecturers including 2 professors, 6 associate professors, 27 lecturers, of which 88.9% holding a PhD degree and the remaining having a Master's degree.

As of academic year 2022-2023, the lecturer-to-student ratio of the Automotive Engineering, Mechanical Engineering Manufacturing, and Mechatronics Engineering is 17.9, 11.3, and 11.2, respectively.

Lecturer selection at SME is said to be conducted focusing on candidates' professional expertise and ethical standards. Recruitment occurs twice a year and is widely advertised in major online newspapers. Candidates must hold a doctoral degree and have a B2 level of English proficiency. For specific programmes, such as Automotive Engineering and Mechatronics Engineering, candidates must also have graduated with honours and have publications in ISI journals. Recruitment procedures are based on departmental needs, prioritising candidates with doctoral degrees and international study experience. The criteria for recruitment are publicly available on HUST's website, as stated in the SER. The recruitment process involves receiving applications, organising examinations and interviews by the recruitment committee, and a micro-teaching session. New lecturers undergo a one-year probationary period, during which they must demonstrate their teaching skills and professional development. At the end of this period, they are evaluated by faculty members and administrative staff on various criteria, including teaching methods and class management. In addition to full-time staff, SME programmes also include visiting lecturers who must have relevant qualifications and teaching experience.

Regarding staff development, the university states that over 60% of SME's lecturers are supported to pursue Master's and Doctoral studies abroad in countries like Japan, Taiwan, Korea, Germany, the United States, and England. Lecturers can apply for these opportunities based on their training needs. Those attending HUST's postgraduate programmes receive full tuition support if they complete their studies on time, and 50% if they are a year late. Their salaries are regulated by state standards, with additional income based on workload, provided it does not interfere with their studies.

In addition to long-term programmes such as PhDs, SME is said to organise short-term training annually to enhance professional skills, pedagogical methods, and management abilities. Staff are also required to take English training courses if they do not meet the minimum proficiency level. To boost professional capacity and foster research cooperation, SME regularly hosts seminars with domestic and international scientists. HUST supports staff development through a dedicated annual budget for training activities, as the university states in the SER.

Experts' evaluation

The report on the faculty at HUST demonstrates professionalism and sustainable development in teaching, research, and management. With a total of 1,690 staff members, including 1,066 lecturers, 76.7% holding a doctoral degree, and 25.1% being professors or associate professors, it is evident that the university prioritises academic excellence and scientific research. This commitment not only ensures in-depth knowledge for students but also enhances HUST's academic standing on the international stage.

The organisational structure of SME with its four specialised departments reflects a high degree of specialisation, ensuring efficient administration and education. Each department is responsible for distinct academic programmes, allowing students to acquire specialised knowledge aligned with industry demands. Notably, the lecturer-to-student ratios in programmes such as Automotive Engineering, Mechanical Manufacturing

Engineering, and Mechatronics Engineering demonstrate the university's serious investment in educational quality. Students highlighted the positive relationship they share with the teaching staff, noting that the support provided by teachers is satisfactory. They also value the strong sense of collaboration between students and lecturers within research groups.

The recruitment process at SME is conducted with transparency and rigor, focusing on the candidates' professional expertise, ethical standards, international experience, and scientific publications. The selection process involves a specialised recruitment committee and includes a micro-teaching session to ensure that new lecturers possess not only solid knowledge but also effective teaching methods. This contributes to improving instructional quality and building an outstanding faculty team.

Furthermore, HUST's faculty development policies are commendable, with over 60% of SME lecturers receiving support for studying and conducting research in leading educational institutions in countries such as Japan, Germany, and the United States. Financial support mechanisms for domestic and international postgraduate students reflect the university's strong commitment to academic advancement. In addition to long-term programmes, SME also organises annual short-term training courses to enhance professional skills, pedagogical techniques, and managerial competencies.

During the site visit, students of the ME-GU and ME-LUH programmes (the international cooperation programmes) have expressed a desire for increased engagement with international faculty. The presence of international lecturers would provide students with diverse perspectives on global engineering practices and enhance their understanding of industry trends worldwide. This would improve the students' soft skills and communication abilities, reducing their hesitation when interacting with foreigners. It is therefore recommended that the university develop a long-term action plan to increase the number of guest lectures delivered by international academics **(Finding 9)**.

In conclusion, HUST has established a well-structured, specialised, and globally integrated system for faculty development and teaching. These policies and strategies not only enhance the quality of education but also lay the foundation for the university's continued growth and excellence in the future.

Conclusion

The criterion is fulfilled.

6. Learning resources and student support

Bachelor's/Master's degree
Appropriate facilities and resources are available for learning and teaching activities.
Guidance and support is available for students which includes advice on achieving a successful completion of their studies.
[ESG 1.6]

Description

Learning resources

HUST covers a total area of 25.6 hectares, providing a land area of 7.4 m² per student and a floor area of 8.9 m² per student. The campus includes 293 classrooms, 406 laboratories and practice rooms, two auditoriums, and one library. Each classroom is said to be equipped with a projector or LCD screen, a sound system, a board, student and lecturer desks and chairs, fans, and air conditioning. The university also provides indoor and outdoor sports facilities such as fitness, aerobics, football fields, tennis court, and swimming pool, a

medical centre, dining places, as well as other convenient facilities such as photocopy shops, stationery stores, ATMs, and vending machines.

The library located in the HUST campus has an area of 37,000 m^2, including seven reading and borrowing rooms with 1,500 seats for readers, as stated in the SER. For the Automotive Engineering programme, there are 267 specialised materials, comprising 184 textbooks and reference books, along with 83 theses and dissertations. The Mechanical Machine Manufacturing programme offers 1,363 specialised materials, including 429 textbooks and reference books, and 934 theses and dissertations. The Mechatronics Engineering programme provides 264 specialised materials, with 80 textbooks and reference books, and 184 theses and dissertations.

At the school level, SME has 120 laboratories and practice rooms (with a total area of 12,824.96 m^2), equipped with machinery and equipment used in various practical courses such as Basic Machining Tools, CNC Technology, Manufacturing Technology, Industrial Robots, Electric Vehicles, Automotive Testing Systems, and internships. The practical and experimental equipment is managed by the Mechanical Engineering Centre, Joining and Welding Research Institute (JWRI) HUST-OU, Research Centre for Propulsion Systems and Autonomous Vehicles and Smart Digital Factory Laboratory.

Student support

The university states in the SER that there are several scholarships to support students during their studies, namely Scholarships for students with outstanding performance; Tran Dai Nghia Scholarship for students having difficult economic conditions; Sponsored scholarships from individuals, organisations, and businesses both domestic and international; International student exchange scholarships; and Hometown connection scholarship.

HUST is said to offer student support in various aspects, including academic advising, administrative assistance, career orientation, job counselling, psychological support, health care, extracurricular activities, and financial aid. Events like "Admission Counselling and Career Orientation Day" provide guidance to prospective students. The Student Information System (SIS) tracks academic progress, while class managers and advisors assist with study plans and resources. Orientation week introduces new students to university life, and career guidance is provided throughout their studies.

Experts' evaluation

The university provides exceptionally strong student support. Students benefit from small class sizes, fostering close relationships between students and lecturers. The teaching staff is highly engaged and demonstrates a clear commitment to student well-being, which was evident during the expert discussions. The university offers numerous scholarships and financial support options, further contributing to an inclusive learning environment. Additionally, the active alumni network provides valuable guidance and professional opportunities for students. The international partnerships with Germany and Australia are well-coordinated, offering students valuable exchange opportunities. Despite some bureaucratic challenges, such as visa issues, which are beyond the institution's control, students confirm that the organisation and advisory services are highly effective. The university should focus on maintaining these partnerships in the coming years and ensuring that student support continues at this high level.

In terms of material resources, the university in general provides well-equipped laboratories. Practical, project-based learning and joint research groups further enhance the hands-on experience for students. The university has a strong connection to the industry, ensuring high employability rates for graduates. The programme structure is well-organised, generally allowing students to complete their studies within the expected study period. Course-related information, including module descriptions, intended learning outcomes, teaching methods, and assessment formats, are clearly documented in the SER and the diploma supplement. However, there is

room for improvement regarding the laboratory facilities of the Automotive Engineering programme, which require additional support to better meet industry needs. To address this issue, the faculty should strengthen its engagement with the growing industry in Vietnam and seek partnerships for acquiring additional hardware in the field of automotive engineering aforementioned **(Finding 10)**.

Conclusion

The criterion is fulfilled.

7. Information

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

Description

HUST provides updated training information to students and stakeholders through multiple channels, primarily via the official HUST and SME websites. Functional units within the university also share specific information on their respective sites. Additionally, HUST communicates with students using online platforms like Facebook, YouTube, Twitter, Yammer, and LinkedIn, 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 provides details on programmes and expected learning outcomes, including course content and objectives, via the SME and Academic Affairs websites, brochures, and induction sessions. Additionally, HUST transparently shares details on admissions, tuition fees, and scholarships on the Admissions Department's website. This includes information on admission methods, selection criteria, and comprehensive scholarship programmes, ensuring all candidates have access to the necessary resources.

Experts' evaluation

Based on the evidence provided to the experts, it can be concluded that the primary source of information for external stakeholders is the official homepage of HUST. The website provides a comprehensive overview of the study programmes and the institution, ensuring that relevant stakeholders and the general public can access key details regarding the programme structure, intended learning outcomes, selection procedures, awarded qualifications as well as teaching, learning, and assessment methods. Additionally, students benefit from an internal portal that offers course-specific information, allowing them to stay informed about their studies in a structured and transparent manner. The availability of this information ensures that prospective and current students, as well as other stakeholders, can make well-informed decisions regarding the study programmes.

To ensure impartiality, objectivity, and regular updates, HUST has established processes and structures that govern the dissemination of information. The website and internal portal are maintained by designated administrative units that ensure accuracy and consistency. Furthermore, learning outcomes and course content information are made continuously accessible to students, reinforcing transparency in the academic environment. Regular reviews and updates help keep the information provided current and aligned with institutional and regulatory requirements. These mechanisms contribute to a structured and reliable information policy, which supports both student orientation and institutional accountability.

Conclusion

The criterion is fulfilled.

V. Recommendation of the panel of experts

The panel of experts recommends accrediting the study programme **"Mechatronics Engineering (Bachelor's degree)"** offered by **Hanoi University of Science and Technology (Vietnam)** without conditions.

The panel of experts recommends accrediting the study programmes **"Automotive Engineering (Bachelor's degree)"** and **"Machine Mechanical Manufacturing (Engineer's degree)"** offered by **Hanoi University of Science and Technology (Vietnam)** with conditions.

Commendation:

Hanoi University of Science and Technology is to be commended for its well-organised faculty and dedicated teaching staff, who provide exceptional support to students. The strong relationship between students and lecturers, alongside joint research groups, fosters a collaborative learning environment. International cooperation with Germany and Australia, industry connections, and support from alumni further enhance opportunities for students. With a practical, project-based approach, modern labs sponsored by big corporations, and a high graduate employment rate, the institution ensures confident and well-prepared graduates for professional environment.

Findings:

1. The duration of the internship should be extended from five to seven weeks to six months and become a standard for all study programmes in order to allow students more time to adapt to practical tasks and gain hands-on experience.
2. In order to sharpen the profile as well as to highlight the distinction between the study programme "Automotive Engineering" and other engineering programmes, the following actions must be carried out:
    a. More specific and current topics on automotive engineering (e.g., new EV technologies and digital topics) must be integrated into the curriculum.
    b. The title of certain courses must be modified to reflect the main topic of those courses more precisely.
3. Regarding the supporting tools and software for students of the study programme "Automotive Engineering", it is recommended to further intensify the use of CAE-driven simulation, design, and R&D software tools; to train students with more state-of-the-art tools; and to make 3D CAD mandatory for all students of this programme.
4. More specialised knowledge and management methods, especially quality management, must be integrated into the curriculum of the study programme "Mechanical Machine Manufacturing" in the next revision.
5. The newly developed curricular structure of the study programme "Mechanical Machine Manufacturing" must be submitted to ensure that the quality and ILOs of the study programme remains unchanged despite the reduced study duration from five years to eight semesters.
6. The university should establish an institutional mechanism such as an industrial advisory committee to engage the industry representatives into formal dialogues with the university and the faculty.
7. It is recommended to thoroughly investigate and document the reasons for student dropout of all study programmes to address the issues with more effective measures.

8. To facilitate the suggested prolonged internship (3-6 months), it is recommended that HUST fully optimise the use of blended learning by incorporating more online modules
9. The university should develop a long-term action plan to increase the number of guest lectures delivered by international academics.
10. For the study programme “Automotive Engineering”, the experts recommend strengthening its engagement with the growing industry in Vietnam and seek partnerships for acquiring additional hardware in the field of automotive engineering.