ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes
Mechatronics Engineering (Advanced Programme)
Mechatronics Engineering (Joint Programme with Nagaoka University – Japan)
Materials Science and Engineering (Advanced Programme)

Provided by
Hanoi University of Science and Technology, Vietnam

Version: 9th April 2024

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Cơ điện tử tiên tiến	Bachelor programme in Mechatronics Engineering	ASIIN	-	01, 02
Cơ điện tử (hợp tác với đại học Nagaoka)	Bachelor programme in Mechatronics Engineering (Joint Programme Nagaoka University Japan)	ASIIN	-	01, 02
Chương trình tiên tiến Khoa học và Kỹ thuật Vật liệu	Bachelor programme in Materials Science and Engineering	ASIIN	-	5
Date of the contract: 09.03.2022 **Submission of the final version of the self-assessment report:** 04.10.2022 **Date of the audit:** 9.-10.11.2022				
Peer panel: Prof. Dr.-Ing. habil. Daisy Nestler, Chemnitz University of Technology Prof. Dr. sc. techn. Harald Loose, Brandenburg University of Applied Sciences Prof. Dr.-Ing. Hartmut Ulrich, Ruhr West University of Applied Sciences Prof. Dr.-Ing. habil. Olaf Wünsch, University of Kassel Nhut Huynh Hoang, student atHo Chi Minh City University of Technology Thi Hong Ngoc Dang, Zebra Technologies				

[1] ASIIN Seal for degree programmes

[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering; TC 02 – Electrical Engineering/Information Technology; TC 05 – Materials Science/Physical Technologies

Representative of the ASIIN headquarter: Daniel Seegers	
Responsible decision-making committee: Accreditation Commission	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014 Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering/Process Engineering as of 16.03.2021 Subject-Specific Criteria of Technical Committee 02 – Electrical Engineering/Information Technology as of 09.12.2011 Subject-Specific Criteria of Technical Committee 05 – Materials Science/Physical Technologies as of 18.03.2022	

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Mechatronics Engineering	Cử nhân/BSc	-	6	Full time	no	8 Semesters	132 Vietnamese Credits / 264 ECTS	Annually / 2006
Mechatronics Engineering (MECHA Joint HUST-NUT Program)	Cử nhân/BSc	-	6	Full time	Nagaoka University - Japan	8 Semesters	132 Vietnamese Credits / 264 ECTS	Annually / 2014
Materials Science and Engineering	Cử nhân/BSc	-	6	Full time	no	8 Semesters	132 Vietnamese Credits / 264 ECTS	Annually / 2006

[3] EQF = The European Qualifications Framework for lifelong learning

Established in 1956, the Hanoi University of Science and Technology (HUST) is a federal university committed to human development, high-quality workforce training, scientific research, technological innovation, and knowledge transfer that serves the country and the global society. HUST describes itself as research-oriented, multi-disciplinary and serving the practical development of the country. This higher education institution (HEI) has a large network of domestic and international cooperation partners in both education and industry. HUST offers 67 undergraduate programs, including 34 standard programs, 27 honors programs (advanced programs), six international joint programs as well as 35 master programs and 32 doctoral programs. The programs at HUST are divided into standard and advanced programs, where advanced programs are fully taught in English, with the exception of one program in Thai.

For the Bachelor's degree programme Mechatronics Engineering, the university has presented the following objectives in the Self-Assessment Report:

"Graduates will

- Have basic knowledge and skills in mathematics and applied sciences in the fields of mechanics, electricity-electronics, control and information technology to meet the acquisition of specialized knowledge; Specialized knowledge to: operate, maintain, calculate and design mechatronic systems; solve mechatronic technical issues
- Have personal and professional skills suitable to an interdisciplinary working environment, international integration and adapting to the industrial revolution 4.0; have the ability to start a business.
- Have effective communication and teamwork skills in a professional environment and in the community.
- Have the ability to formulate ideas, design, implement and operate the system in the context of business and society. "

For the Bachelor's degree programme Mechatronics Engineering (Joint Programme with Nagaoka University Japan), the university has presented the following objectives in the Self-Assessment Report:

"Graduates have

- Have basic knowledge and skills in mathematics and applied sciences in the fields of mechanics, electricity-electronics, control and information technology to meet the acquisition of specialized knowledge; Specialized knowledge to: operate,

maintain, calculate and design mechatronic systems; solve mechatronic technical issues

- Have personal and professional skills suitable to an interdisciplinary working environment, international integration and adapting to the industrial revolution 4.0; have the ability to start a business.
- Have effective communication and teamwork skills in a professional environment and in the community.
- Have the ability to formulate ideas, design, implement and operate the system in the context of business and society. "

For the Bachelor's degree programme Materials Science and Engineering, the university has presented the following objectives in the Self-Assessment Report:

"Graduates will

- Have focused knowledge in professional background, understanding the research methodology and the updated technologies in the materials field in order to work independently and adapt to the jobs involving the common field of materials science and engineering.
- Have professional skills and personal qualities needed to succeed in their career.
- Have social skills needed to work effectively in the interdisciplinary team, and to fulfil the requirement of the industrial projects in an international environment.
- Have enough ability and skills to study in the higher level or to work in the educational and research affiliations in Vietnam or over the World."

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The peers refer to the respective ASIIN Subject-Specific Criteria (SSC) of the Technical Committees 1 (Mechanical Engineering/Process Engineering), 2 (Electrical Engineering/Information Technology) and 05 (Materials Science/Physical engineering) the objective-module-matrices for each degree programme, the matching learning objectives and the modules as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes Mechatronics, Mechatronics (JOINT Nagaoka), Materials Science and Engineering correspond with the competences as outlined by the SSC. The descriptions of the qualification objectives are comprehensive and include the achieved competencies and possible career opportunities of the graduates.

The Hanoi University of Science and Technology (HUST) has described programme objectives (POs) and programme learning outcomes (PLOs) for each of the three degree programmes under review. While the POs are developed based on the vision and mission of the university as well as the respective School and are rather general, the PLOs describe in greater detail the competences the students should acquire during their studies. Furthermore, there are regular revision processes in place that take into account feedback

by external and internal stakeholders. A major revision including consultations of stakeholders takes place every two years.

The information on POs and PLOs is part of the self-evaluation report and can therefore be checked by peers. However, some of the information is not reliably accessible on the HUST website and is therefore not available to all stakeholders. This is further described in criterion 5.3.

The peers note that the development of PLOs of the study programmes involves both internal and external stakeholders so that the curricula can be adapted and modified according to the needs of the industry and the graduates on a regular basis. For example, HUST regularly conducts surveys, through which the different stakeholders get the chance to assess the programmes and their main objectives and adapt them if necessary. Internal stakeholders include all of HUST members (students, teaching staff, and non-academic employees), while the external stakeholders include the industry, alumni, the government, and society.

At the end of their studies, graduates of the Bachelor's degree programme Mechatronics Engineering (APME) have acquired the basic mathematical and scientific knowledge to participate in the design and calculation of mechatronic systems, processes and products. They will also be able to apply basic knowledge of the discipline to participate in the analysis of mechatronic systems, processes and products. The programme is defined as an advanced programme and is therefore taught in English. This enables graduates to pursue a variety of careers in a national or international context, including mechatronics engineer, analyst, researcher, consultant, researcher or lecturer.

The objective of the Bachelor's degree programme Mechatronics Engineering (JOINT Nagaoka – ME-NUT) is to produce graduates in the field of mechatronics who are competent in professional knowledge, socially responsible, equipped with soft skills, have professional and research skills, and the ability to work and be creative in any work environment. Overall, it differs from the Advanced Mechatronics Engineering programme only in its focus on the Japanese labour market. The programme is partly taught in Japanese and parts of the curriculum can be completed in Japan at Nagaoka University. The rest of the programme is designed in the same way as the Advanced Mechatronics Engineering programme.

Graduates of the Bachelor's degree programme Materials Science and Engineering (AMSE) should be able to apply core knowledge in mathematics, physics, chemistry and information technology to identify, analyse and solve problems within the field of materials science and engineering. This will enable them to work with modern tools to collect and analyse data, and to design and evaluate engineering solutions. The programme is defined as an advanced programme and is therefore taught in English. As a result, graduates of this

programme shall be able to work as engineers, analysts, consultants, researchers or lecturers in public and corporate contexts, both nationally and internationally.

Next to the professional skills, the students of all three study programmes are supposed to acquire personal and social skills such as critical and creative thinking, communication skills, adaptability, the capacity to work in (international) teams, and leadership skills. In addition, they should be able to solve problems through research and the application of different concepts and methods.

The peers note that the Faculty of Mechanical Engineering offers five bachelor programmes in mechatronics. Although only two of them are to be reviewed in this report, they ask the programme coordinators to clarify the differences between these programmes. As the programme coordinators explain, the main differences are in the language aspect and the orientation towards the labour market of the partner university. These partner universities have also provided the first versions of the curricula, which have been consistently adapted to the Vietnamese market and today's challenges. The standard programme is taught in Vietnamese, while the advanced programme is taught in English. The joint programme with Nagaoka University is partly taught in Japanese, and the partner programme with Leibniz University Hannover requires students to learn German. In addition, the Faculty offers a programme for highly qualified students specified in intelligent mechatronics and robots in Vietnamese.

As far as the mechatronics programs are concerned, the peers recommend that the inter- and multidisciplinary nature of mechatronics be reflected more strongly in the learning objectives. At present, both programs mostly resemble a mechanical engineering program. While mechanical engineering is definitely an important component of mechatronics, computer science and electrical engineering aspects could also be reflected in the learning outcomes. From a peer perspective, it could be more apparent that mechatronics is divided into different topics, but is more than the sum of its parts. They recommend making both mechatronics programs more distinct from mechanical engineering.

In general, the peers found, that, the intended qualification profiles of all degree programmes are clear, plausible and allow students to take up an occupation, which corresponds to their qualification. They learn that the graduates of HUST are much sought after in the labor market. The representatives of industry emphasize the high quality of the graduates of all three programmes under review and students as well as graduates are satisfied with and well aware of their good job perspectives.

In summary, the peers confirm that the three Bachelor’s degree programmes adequately reflect level 6 of the European Qualification Framework (EQF). The programme learning outcomes of all three programmes are consistent with the respective ASIIN Subject-Specific Criteria of the Technical Committees of Mechanical Engineering/Process Engineering,

Electrical Engineering/Information Technology and Materials Science/Physical engineering. They aim at the acquisition of specific competences and are well-anchored and binding.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- Samples of Diploma Supplement for each degree programme

Preliminary assessment and analysis of the peers:
The peers confirm that the English translation and the original Vietnamese names of all degree programmes under review correspond with the intended aims and learning outcomes as well as the main course language.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering
- Discussions during the audit

Preliminary assessment and analysis of the peers:
The two Mechatronics Engineering programmes are managed by the School of Mechanical Engineering (SME), while the Materials Science Engineering degree programme is managed by the School of Materials Science and Engineering (MSE) which are both part of the Hanoi University of Science and Technology (HUST). All degree programmes at HUST are required to have a minor revision annually and a major revision every two years. The current study plans were designed in 2021, in the course of the last major revision.

All three Bachelor's degree programmes under review are designed for eight semesters and at least 132 Vietnamese credits, which is equivalent to 264 ECTS points, need to be achieved by the students. Students with superior academic performance can complete their studies within seven semesters. However, students who cannot fulfil all requirements for graduation within 13 semesters may not continue studying at HUST.

An academic year at HUST consists of two semesters and a short summer term. The summer term is normally used for conducting the internship. Some courses are offered in

the summer term, which lasts for ten weeks, based on the demands of students. A regular semester consists of sixteen weeks for learning and teaching, one week for mid-term tests, and two to three weeks for final exams. The mid-term tests are normally given at the ninth week of a semester.

The general structure of the curriculum is similar for all three Bachelor's degree programmes. In the first year, students mainly take general courses such as mathematics, natural sciences, social sciences, humanities, and economics with the same content for all students in both Schools. From the second year, students can take part in core courses and specialized courses in their respective field. Furthermore, students can select electives according to their personal interests and after consultation with their academic advisors. During their studies, all students must spend at least six weeks to study and work in companies for their internship. In the final year, students have to complete their Bachelor's thesis. For both internship and thesis, students have to submit their reports, present and defend it in front of a panel.

The members of the teaching staff explain on demand of the peers that they offer possible topics for the final projects according to their own research projects. All members of the teaching staff supervise theses. Students have to design a research proposal with a time schedule for the project, which is discussed with the supervisor. If they agree, the students apply formally for being allowed to work on the suggested topic.

The degree programmes consist of courses in the areas:

- Mathematics and Basic Sciences (64 ECTS, all compulsory)
- Social Sciences and Humanities (26 ECTS, all compulsory)
- Foreign Languages (12 ECTS, all compulsory)
- Military Training and Physical Education
- Core Courses (96 ECTS, all compulsory)
- Soft Skills Courses (6 compulsory ECTS, 12 elective ECTS)
- Elective Courses (34 ECTS, all elective)
- Internship (4 ECTS, all compulsory)
- Thesis (12 ECTS, all compulsory)

The structure is depicted in the following table:

Module	Fields	APME				ME-NUT				AMSE			
		Credits			%	Credits			%	Credits			%
		Compulsory	Elective	Total		Compulsory	Elective	Total		Compulsory	Elective	Total	

I	Mathematics and basic sciences	32	0	32	24.2	32	0	32	24.2	32	0	32	24.2
	Law and Political Education	13	0	13	9.9	13	0	13	9.9	13	0	13	9.9
	English	6	0	6	4.6	6	0	6	4.6	6	0	6	4.6
	Japanese	0	0	0	0	270 class hours				0	0	0	0
	National Defense and Physical Education												
II	Basic Core of Engineering	47	0	47	35.6	47	0	47	35.6	48	0	48	36.4
III	Soft skills	3	6	9	6.8	9	0	9	6.8	3	6	9	6.8
IV	Concentrations	0	17	17	12.9	0	17	17	12.9	0	16	16	12.1
	Advanced courses	0	0	0	0	180 class hours				0	0	0	0
V	Bachelor Practicum	2	0	2	1.5	2	0	2	1.5	2	0	2	1.5
	Bachelor Thesis	6	0	6	4.5	6	0	6	4.5	6	0	6	4.5
	Totals	**109**	**23**	**132**	**100**	**115**	**17**	**132**	**100**	**110**	**22**	**132**	**100**

Foreign students do not have to do military training.

The internship is conducted through collaboration with companies or other external institutions. It usually lasts six weeks if students conduct it full time which is valued by the students as this allows them to apply the skills, they learned in the programmes in a real working environment. The students highlight that the university is very supportive in finding placements for the internship and that they are always encouraged to gain as much practical experience as possible. The university has established useful guidelines for these internships and every student has one advisor at the company and one at the university to ensure that the work contributes to achieving the programme's learning outcomes. The assessment methods to evaluate this phase is comprehensive and includes a written report and a presentation of their results in front of a panel of two lecturers. The evaluation takes into account the aspects work plan, discipline, teamwork, programme implementation, and activity report.

During the audit, the peers discuss the definition of Advanced Programmes and their difference to regular programmes with the HUST representatives. The programme coordinators explain that the term "Advanced" indicates that the programme was originally designed on the basis of a technically equivalent programme from a leading university

worldwide, commonly in the USA. It is mandatory that the Advanced Programme is taught in English and has a cooperation with this leading university abroad. After reviewing the curricula, the peers note that there is almost no difference at the technical level between the Advanced programme APME, the regular programme and the ME-NUT programme. The programme coordinators confirm that academically these programmes are almost identical. The same goes for the AMSE programme. The peers come the conclusion that according to their understanding the title “Advanced” stipulates a higher level of the academic programme; thus, they agree that all programmes that are titled “Advanced Programme” should not only show an advanced level in terms of foreign i.e. English or Japanese language skills but also in terms of technical competencies. They recommend therefore either to take the curriculum of the advanced programmes to a higher level or to change the title of the programmes.

The advanced programmes are taught entirely in English and aim for a higher TOEIC score (650), whereas the joint programme in mechatronics with Nagaoka University is partly taught in Japanese and aims to qualify graduates with at least a N3 level of the Japanese Language Proficiency Test and a TOEIC score of 385. However, the industry representatives emphasise that the English skills of students absolving internships in their companies, or graduates employed by them, could be improved. They think that students should be offered more opportunities to actively speak English. This could be achieved e.g. by discussing international papers or giving more oral presentations in English. Therefore, the peers recommend improving the English skills of the students.

Finally, the peers ask how the teaching staff and the prospective employers evaluate the soft skills of the students. They learn that the students from HUST are particularly resilient in many respects: both in terms of competition and in terms of their perseverance. In spite of this, the industry representatives also underline that specific soft skills as the ability to publicly speak and present in front of an audience, communicate with clients, teamwork and project management skills could still be improved. Consequently, the peers recommend to strengthen the soft skills of the students through designated coursework or integration into existing coursework, in particular public speaking, communication, team work and project management skills.

For the mechatronic programmes PO-1 states, that the students gain specialized knowledge to operate, maintain, calculate and design mechatronic systems. The curriculum reflects mainly operating and maintaining. There is a lack of calculation, designing, analyzing and especially modelling of mechatronic systems.

The overall objectives and intended learning outcomes as well as the curriculum of the both Mechatronics programmes would be also suitable for an advanced Mechanical Engineering programme. It could be recommended to sharpen the Mechatronics programmes, to

underline the inter- and multidisciplinary nature of Mechatronics and to balance the number of modules from different physical domains.

In the opinion of the expert panel, the curricula are well suited to meet the learning outcomes and to teach the students all necessary skills in their technical fields. They consider, the overall objectives and intended learning outcomes for all three degree programmes are systematically substantiated and updated in its individual modules. The module handbooks clear state, which knowledge, skills and competences students will acquire in each module.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Admission handbooks
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the Self-Assessment Report, admission for three undergraduate programmes is conducted once a year in September of each year. Information about the admission procedure is described in the Admission handbooks and on the website of Academic Affairs Office and thus accessible for all stakeholders. In addition, HUST provides support on admission requirements and procedures for high school students. An admission committee is established by the Rector of HUST each year to manage all admission issues. High school graduates can join the programmes through one of the following four admission paths:

1. Admission for Talented Students: candidates can select one of the three different categories: assessment of excellent students according to the regulations of the Ministry of Education and Training, admission based on international certificates including SAT, ACT, A-Level or admission based on results and achievements in high school combined with interviews. The Talent Admission Registration System is opened by HUST at least 90 days before the National Higher Education Entrance Examination. Students have 30 days in which to submit their applications. days. The results of the talent admission are publicly announced on the HUST website.
2. Admission based on the results of the High School Graduation Exam: Candidates are admitted based on their scores in the national entrance examination. The scores are calculated based on groups of three different subjects. The first group

comprises Mathematics, Physics, and Chemistry (named as A00). The second group includes Mathematics, Physics, and English (named as A01). The last one is Mathematics, Literature, and English (named as D01). Mathematics appears in all groups for student recruitment, because the knowledge of Mathematics is considered to be a solid foundation for accumulating specialized knowledge, making an important contribution to achieving the learning outcomes of the programme.

3. Admission based on the results of the private entrance examination: candidates participate in a Scholastic Aptitude Test organized by HUST. The test consists of mathematics, reading tests, and multiple choice questions about physics, chemistry, biology, and English.
4. Admission to Vietnamese and foreign candidates graduating from international high schools (Australia, USA, Canada, etc.).

Every summer, the Vietnamese Ministry of Education and Training will organise the Annual National Entrance Exam. All high school students in Vietnam must take part at this exam. It covers several subjects, such as mathematics, foreign languages, physics, chemistry, literature, and history and lasts three to four days. Based on the score in the exam and on their preferences, prospective students get admitted to the different universities.

For each academic year, the university determines the ratio of students admitted through these different ways. The number of applicants has slightly increased within the last few years and now partly exceeds the number of available places. In 2019, there were 80 available places for the APME degree programme and 82 students were enrolled. In 2021, there were 120 available places for the same programme while 132 students were enrolled. For the ME-NUT degree programme, there were 100 available places in 2019 while 116 new students were enrolled. In 2021, there were still 100 available places for the same programme but 136 students could be enrolled. Finally, for the AMSE degree programme, there were 30 available places in 2019 while 44 new students were enrolled. In 2021, there were 50 available places for the same programme, while 66 new students could be enrolled.

The tuition fee is fixed and the same for all semesters and all undergraduates programmes at HUST. It is 1000 USD per academic year for full-time students. There are different levels for these fees, depending on the amount of credits the student registered to fulfil in each semester and the tuition fee rate. Furthermore, the Academic Affairs Office awards scholarships to the students with excellent performance based on the student's academic performance. Students with very good results (top 10% GPA of their respective intakes at their School) can receive scholarships in the following semester. In addition, students at HUST can also receive scholarships from external sources such as companies, non-government organisations, faculty alumni, and individuals.

In addition, HCMUT has a policy to award tuition fee waivers for students who are orphaned by both parents, students with disabilities in poor or near-poor households or students from remote areas.

In summary, the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

[...]

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Academic Guidelines
- Module descriptions
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering
- Discussions during the audit

Preliminary assessment and analysis of the peers:

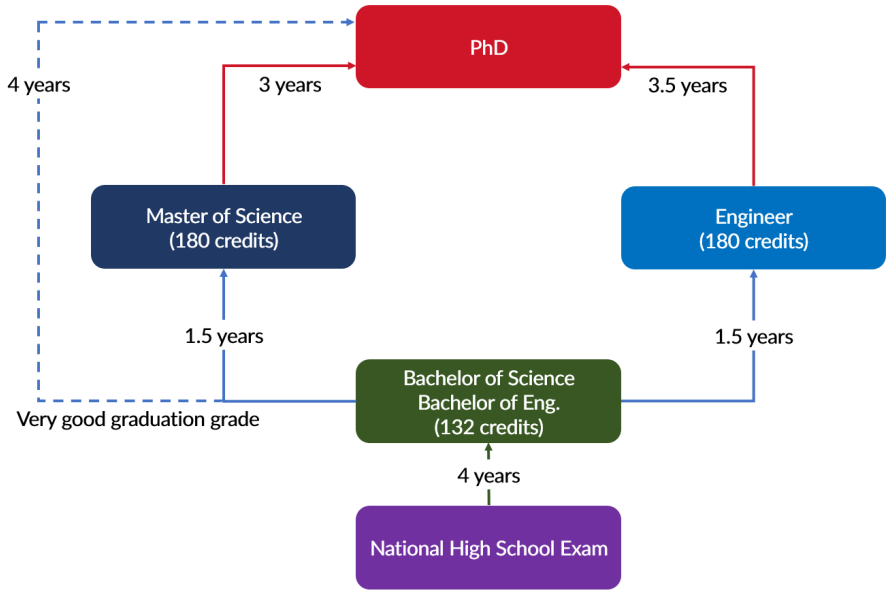
HUST states, that the Bachelor programmes of APME, ME-NUT, and AMSE are practical oriented and provide both knowledge and practices to students. All three programs consist of 132 Vietnamese credit points distributed to eight semesters. According to the SAR, the number of complementary elective courses was increased during the last years to enlarge the experience of practical training having now an amount of nine credits. In their SAR as well as the module handbook, the university explains in detail the individual competences and skills that are associated with each of these module groups and the individual courses and which individual modules contribute to which learning outcomes. The peers thus gain

a distinct overview of the curricular content of all degree programs as well as the structure of the modules.

Overall, the expert panel finds the structure of the modules to be adequate and manageable. They confirm that all three bachelor study programs are divided into modules, which are the sum of teaching a specifically defined content. Through the choice of modules, the structure ensures that the learning outcomes can be achieved. The three programs under review include a certain variety of elective courses among which the students can choose in order to develop individual specializations and course of study (student mobility, work experience etc.). The structure of the curriculum allows students to complete the degree without exceeding the regular course duration. The expert panel further assert, that the modules have been adapted to the requirements of the degree programme. They ensure that each module objectives helps to reach both the qualification level and the overall intended learning outcomes.

While looking at the provided study plans, the peers notice that for the Me-NUT programme no credits are awarded for the Japanese language courses nor for the courses at the partner university. The workload for the Japanese courses is indicated as 810 hours and the workload for the advanced courses as 540 hours. The peers consider this a high workload that is not remunerated. However, students will receive a language certificate for their Japanese course and a certificate for any advanced course they choose. According to the ASIIN criteria, all compulsory parts of the programmes have to be awarded ECTS points, the peers expect HUST to award ECTS points according to the stated workload. While the implementation of the Joint programme was discussed and explained during the discussions during the visit, neither the website nor the self-assessment report explains the exact procedure. Therefore, the peers urge HUST to provide a written English version of the underlying concept.

In 2020, HUST introduced three main academic models for its undergraduate programmes. The model discussed here is the standard version of the Bachelor's programmes. Students who complete their studies in 4 years will receive a Bachelor of Science degree, but will have the option to add 1.5 years to qualify as an engineer or to obtain their Master of Science degree instead. Previously, the additional time to qualify as an engineer was only 1 year. During the period under review, most students chose to combine their Bachelor's degree with the Engineer qualification and studied for 5 years. The percentage of graduated students in time was 57% (APME), 38% ME-NUT and 46% (ASME) in 2017. HUST hopes that the recent changes to the programmes will further improve these numbers.



Mobility

HUST offers its students various options in terms of student mobility. By participating in several scholarship programmes such as ERASMUS Mundus and having cooperations with a wide array of universities abroad, students can choose from a broad catalogue of destinations and partner universities for an exchange semester. For instance, HUST has cooperations in countries such as Germany, Finland, Japan, Sri Lanka and Indonesia. The basis of the semester abroad is constituted by the Memorandum of Understanding and the Learning Agreement, which guide the process and organization of a stay abroad and ensures the recognition of all achievements at the home university. In the audit discussions, the programme managers state that they are actively encouraging students to go abroad and are continuously trying to widen the options for financial support of the students. According to the statistics of outgoing students, 3 students from the APME and ASME programme as well as 91 students from the ME-NUT programme have participated in an exchange project during the last 5 years. The duration depends on the funding scheme, although most offer an exchange for one semester or one year. The peers appreciate the different options for student mobility at HUST as well as the programme managers' efforts in encouraging more students to seize the opportunity for an exchange semester.

The peers appreciate the efforts undertaken by the university to foster student mobility and they are satisfied with the structures and support mechanisms for international mobility.

In summary, the peers agree that the structure and modules of the programmes – apart from the above mentioned restriction - contribute to the achievement of the intended learning outcomes, a successful study process and the job opportunities of the students after graduation. All working practice intervals including the internships are well-integrated

into the curriculum, and the higher education institution vouches for their quality in terms of relevance, content and structure. Further, the experts assure that HUST has established rules for recognizing achievements and competences acquired outside the higher education institution.

Criterion 2.2 Workload and credits

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the legal requirements, the total credit load is 132 Vietnamese credits (equivalent to 264 ECTS) for the three Bachelor's degree programmes under review. The workload is spread relatively evenly over the semesters. Moreover, the effective number of credits the students can take depends on their achievements in the previous semester. In the three Bachelor's degree programmes, students need to take at least 12 credits and maximum up to 24 credits in one semester. The workload of the last two semesters is markedly reduced to give the students enough time for their theses as well as to already start looking for a job. This mechanism is supposed to ensure that the students can really handle the workload. It also means that theoretically, students can finish their studies in less than 8 semesters respectively, although this is relatively rare due to the high workload in general.

In the Vietnamese system, each credit is equivalent to 15 periods of theoretical lecture in class or 30 periods of practical laboratory work with additional 30 periods of self-study. In the internship, the project work and the Bachelor's thesis, it is equivalent to 60 periods. One period lasts for 50 minutes. The workload calculation is depicted in the following table:

Table 2. 3. Workload of some forms of study

Form of study for 1 Vietnamese credit (=2 ECTS)	In class-periods	Self-study periods	Total periods	Total hours
Theoretical lecture	15	30	45	37.5
Practice in a laboratory	30	30	60	50.0
Quizzes in class	30	30	60	50.0
Assignment	45		45	37.5
Project, thesis	60		60	50.0
Internship	60		60	50.0

According to the ECTS credit system, 1 ECTS equals 25-30 hours of students' workload. As a result, there cannot be the same conversion rate between Vietnamese credits and ECTS points for all courses. For theoretical lectures, the rate would be 1 to 1.25 and for practical work 1 to 1.67.

However, the module descriptions mention a different workload. For example, 540 hours are calculated for the Bachelor's thesis of all three study programmes. This is not consistent with the 6 Vietnamese credits (12 ECTS) that are awarded, because this would result in a total workload of 300 hours (6 x 50). The same problem is relevant for the theoretical courses. For example, the module description for "English 2" mentions a total workload of 240 hours and 4 Vietnamese Credits (8 ECTS) are awarded, while 4 Vietnamese credits would mean 150 hours and 8 ECTS would require 240 hours. Therefore, the peers underline that the workload and credit calculation is faulty and inconsistent in several ways. The peers point out that it is necessary to eliminate the inconsistencies in the workload and credit calculation of the Vietnamese as well as the ECTS system. HUST should follow the ECTS Users' Guide and define how many hours of students' total workload are required for one ECTS point (including lecture hours and self-study hours).

During the discussions with the programme coordinators and the students, the peers learn that so far there has been no specific survey asking the students to evaluate the amount of time they spend outside the classroom for preparing the classes and studying for the exams. Since this is necessary in the ECTS framework, the peers suggest asking the students directly about their experiences. This could be done by including respective questions in the course questionnaires. The peers point out that the School of Mechanical Engineering and the School of Materials Science and Engineering should follow the ECTS Users' Guide, while determining the students' total workload. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations).

In other words, a seminar and a lecture may require the same number of contact hours, but one may require significantly greater workload than the other because of differing

amounts of independent preparation by students. Typically, the estimated workload will result from the sum of:

- the contact hours for the educational component (number of contact hours per week x number of weeks),
- the time spent in individual or group work required to complete the educational component successfully (i.e. preparation beforehand and finalising of notes after attendance at a lecture, seminar or laboratory work; collection and selection of relevant material; required revision, study of that material; writing of papers/projects/dissertation; practical work, e.g. in a laboratory),
- the time required to prepare for and undergo the assessment procedure (e.g. exams).

Since workload is an estimation of the average time spent by students to achieve the expected learning outcomes, the actual time spent by an individual student may differ from this estimate. Individual students differ because some progress more quickly, while others progress more slowly. Therefore, the workload estimation should be based on the time an "average student" spends on self-study and preparation for classes and exams. The initial estimation of workload should be regularly refined through monitoring and student feedback.

During the audit, the students emphasise that they consider the workload high but manageable and that it is possible to finish the degree programmes within the expected four years.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

Various teaching and learning methods (including lectures, computer training and classroom and lab exercises, individual and group assignments, seminars and projects, etc.) have been implemented. Structured activities include tutorials, homework, assignments (reading or problem exercises) and practical activities. Group project assignments are given in some courses to develop students' skills in teamwork, communication, and leadership. The assignments and exercises should help students to develop their abilities with respect

to critical thinking, written/oral communication, data acquisition, problem solving, and presentations.

The most common method of learning is class session, with several courses having integrated laboratory practices. Lecturers generally prepare presentations to aid the teaching process. With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to be acquainted with academic research methods.

To help students achieving the intended learning outcomes and to facilitate adequate learning and teaching methods, HUST has developed an e-learning platform (Moodle Course Management System), where students and teachers can interact.

In summary, the peer group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concept of all three undergraduate programmes comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students in the design of teaching and learning processes (student-centred teaching and learning).

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:
HUST offers a comprehensive advisory system for all undergraduate students. Students in the same intake year are organised into classes and every class has an academic advisor. If a class has more than 60 students, it may require more than one academic advisor. The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. The students confirm during the discussion with the peers that they all have an academic advisor.

The academic advisors organise at least two meetings in each term for the classes they are supervising. From the third year, students will have a supervisor directly supervising them

on the projects and the Bachelor's thesis. Each supervisor supervises 5 - 7 students and organises weekly meetings with them.

Students can receive assistance from the Student Affairs Office and the Alumni Office of HUST about career guidance and consultancy, career development training, soft skill training, and job opportunities. The Offices provide information on training and job seeking to help students develop career plans and workplace understanding. The Office are also a bridge between students, staffs, lecturers and businesses in searching for scholarships, factory visits, internships, and employment opportunities. They are also responsible for keeping in contact with alumni associations, employers, and professional organizations. In addition, HUST support its graduates to find suitable jobs by annually conducting a job fair and by forwarding job vacancies to the students. Moreover, during the internship students are introduced to professional life and acquire additional skills that help them finding an adequate position after graduation. In summary, this results in good job perspectives for the graduates of all three undergraduates.

Finally, there are several student organizations at HUST; they include student's activity clubs, which are divided into arts, sports, religious and other non-curricular activities.

The peers notice that there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them. In summary, the comprehensive tutorial and support system for students is one of the strong points of the degree programmes.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

[…]

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- Module descriptions
- Guidelines for Organising an Examination

- Regulation of Thesis Assessment
- Academic Guidelines

Preliminary assessment and analysis of the peers:
Each course has to determine objectives, which support the achievement of the Programme Learning Outcomes of the respective programme. Accordingly, each course must assess whether all defined learning outcomes stated in the module descriptions have been achieved. For this purpose, HUST utilizes various types of examination.

In each course, short class assignments/quizzes, a mid-term and a final examination are employed. There are different assessment methods in the programmes, such as quizzes, written tests, practical performances, assignments, small projects and presentations. In most courses, mid-term and final exam consist of written tests and additional quizzes or assignments are used. However, the other assessment methods are also used to a certain degree. Via the Academic Calendar, the students are informed about mid-term and final exams. The form and length of each exam is mentioned in the module descriptions that are available to the students via the internal university system known as Student Information System (SIS). It is common to hold small quizzes every two or three weeks, but there are generally no unscheduled tests.

The final grade of each module is calculated based on the score of these individual kinds of assessment, whereby the lecturer determines the ratio between them in accordance with the Academic Guidelines. The exact formula (20%, 20% and 60%) is given in the module handbook. At the first meeting of a course, the students are informed about what exactly is required to pass the module and about how the final grade is determined through the teaching and learning plan. HUST uses a grading system with the grades A+, A, B+, B, C+, C, D+, D and F, where a D (equivalent to a Grade Point of 1) is necessary to pass a module and C (equivalent to a Grade Point of 2) to pass the thesis.

Based on the university regulation, the students must retake the whole course if they fail. However, students can request to postpone the final exam due to important reasons (such as accidents, health problems, etc.). In these cases, students will take the final exam in the next semester without repeating the whole course. The reason, why there are no re-sits of the final exam is that the final grade depends on the assessment of the learning activities that will be carried out continuously through the semester and not only on the final exam. Students who fail a course must attend the course again in the next semesters. The number of repetitions is unlimited. Students who have passed a course and want to improve the score, may also take the course again. The peers appreciate that corresponding rules are in place.

However, according to the information obtained during the discussions, there are currently no official rules and regulations on disability compensation measures. As a result, students

solely depend on the initiative of the respective lecturers. To guarantee that students with disabilities can study on an equal footing, HUST should establish formal compensation measures that specify under which conditions and how exams are modified to accommodate students' special needs.

Students with the worse academic results will receive academic warnings. The warning system has three levels: "Academic warning level 1", "Academic warning level 2", and "Suspension". The academic warning is issued if the student violates one of the regulations, such as not affording the minimum number of required credits, finishing the semester with the average grade less than 3.0 (scale 10) or less than 4.0 in the last two consecutive semesters. Students who already have received "Academic warning level 1" would receive "Academic warning level 2" if their performance does not improve in the following semester. In those cases, the students will be suspended. It should be also noted that the student's academic advisor receives the notifications during the course as well. Consequently, help and support would be given to improve the student's academic performance.

The peers discuss with the students how many and what kind of exams they have to take each semester. They learn that for most courses there is one mid-term exam and one final exam in every semester. Usually, there are additional practical assignments or quizzes. The students confirm that a variety of assessment methods is used, including traditional methods such as written, but also presentations or project reports are utilized. The mid-term exams are carried out in the 9th and the final exams in the 16th week of the semester, whereas the smaller quizzes and assignments take place in the other weeks. The final grade is the sum of the sub exams. Although this means that the total number of tests taken during a semester is comparatively high, the students do not complain about this workload and instead appreciate that there are several short exams instead of one big exam as this requires them to continuously study during the entire semester and not having to solely work for one final exam at the end of the semester. The students also confirm that they are well informed about the examination schedule, the examination form and the rules for grading. The peers appreciate their perception.

Every student is required to do a thesis in the last year of studies. Prior to the actual research work, the students are required to write a research proposal and present it in a seminar attended by lecturers and other students who form a research group. The research proposal has to be accepted by the Dean and the supervisor committee who will then appoint the research supervisors. Usually, there are one or two research supervisors for each student. One will act as the principal supervisor and the other act as co-supervisor. In case the student writes her or his thesis in collaboration with the industry, she or he is also assigned a supervisor from the industry. After completing the work on the thesis, the student has to present and defend the results in front of teachers and fellow students.

The peers discuss with the programme coordinators, the members of the teaching staff, and the students about the process of finding suitable topic of the final project or thesis. There are two possibilities: either students can propose their own ideas or they can ask their academic advisor or other teachers for suggestions.

During the on-site visit, the peers were provided with a selection of exams and final projects to check. They confirm that these represent an adequate level of knowledge as required by the EQF level 6 for the three Bachelor's programmes. The forms of exams are oriented towards the envisaged learning outcomes of the respective courses, and the workload is distributed in an acceptable way.

The peers conclude that the criteria regarding the examinations system, concept, and organization are fulfilled and that the examinations are suitable to verify whether the intended learning outcomes are achieved or not.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

[...]

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Reports
- Staff Handbooks
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

At HUST, the staff members have different academic positions. There are associate professors, and lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities.

According to the Self-Assessment Report, there are between 112 full-time lecturers at the school of Mechanical Engineering and 37 full-time lecturers at the school of Materials Science Engineering. In addition, there are some visiting lecturers from other universities

and companies. The technicians support practical classes in terms of preparing computer labs and teaching experiments. Both Schools have 4 respectively 2 staff members who support the Dean in terms of administration, student work, undergraduate and postgraduate training management. Another 35 employees support both schools as laboratory staff.

The following table depicts the number of teachers who are involved in the three degree programmes:

School of Mechanical Engineering				
Full professors	Associate professors	Doctoral holders*	Master holders	Total
4	30	61	17	112
School of Materials Science Engineering				
Full professors	Associate professors	Doctoral holders*	Master holders	Total
2	12	20	3	37

Support Staff	**Program**	**Number**	**Degree Level**	**Support activities**
Administrative Officer	Mechatronics Eng.	04	03 Bachelors, 01 Master	Accounting, student work management, undergraduate and postgraduate training management, etc.
	Materials Eng.	02	02 Bachelors,	
Laboratory staff	Mechatronics Eng.	30	26 Bachelors, 04 Masters	Guiding industrial and specialized experiments, assisting students in practicing, experimenting, preparing laboratory equipment
	Materials Eng.	05	01 Bachelors, 03 Masters, 01 Doctor	

The university encourages the teaching staff with a Master's degree to pursue further qualification. Based on the above figures, the peers conclude that the ratio of academic staff to students is sufficient in all three degree programmes.

Open positions are announced on HUST's webpage, candidates have to do a presentation on their research activities and their teaching abilities are verified. Most of the lecturers are graduates of HUST, who were hired after finishing their undergraduate studies and were conducting their Master's and PhD studies parallel to working as a lecturer or a supporting staff member. However, several teachers have graduated from international

universities (for example, from USA, UK, France, Germany, Australia, Japan, Korea, Thailand, and Singapore).

All fulltime members of the teaching staff are obliged to be involved in teaching/advising, research, and administrative services. However, the workload can be distributed differently between the three areas from teacher to teacher and also depends on the academic position. For example, associate professors spend more time on research activities and less on teaching than lecturers. HUST expects staff members to conduct research activities and has issued a policy, which offers some financial support for publishing papers in international journals. In addition, students are encouraged to participate actively in scientific research activities.

Every year, associate professors or lecturers can apply for promotion to associate professor or full professor, respectively. The criteria of the positions are described by the Board of Professor Consideration. Basically, the candidates are considered based on three main criteria such as: years of working, hours of teaching graduate students, quantity and quality of scientific published papers.

In summary, the peers highlight the well engaged staff members and confirm that the composition and scientific orientation of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Reports
- Staff handbook
- Discussions during the audit

Preliminary assessment and analysis of the peers:
According to the self-assessment report and the discussions during the on-site audit, HUST encourages the continuing professional development of its staff. For this purpose, various opportunities are provided. There is a mandatory didactic training for new academic staff that encompasses curriculum design, teaching material, and innovative teaching and learning methods. Moreover, workshops are held to refresh and to deepen various didactic competences in each semester. The lecturers can also regularly participate in external didactical trainings offered and funded by the government. Senior lecturers must mentor and train the newly recruited staff for at least one year.

The teaching staff is encouraged to study abroad or to participate in international research projects and conferences in order to enhance their knowledge, increase their English proficiency and to build international networks. For this purpose, the university informs

about possible scholarships to support academic mobility. In general, the exchange programmes are funded by international partner universities and organizations. Particularly for junior lecturers with a master's degree, the programmes offer systematic training to prepare them for acquiring a PhD abroad, for instance through English courses, information on foreign education systems, administrative support, and supporting (international) research collaborations. Teachers involved in a staff exchange programme are generally assigned to a partner university abroad that has a MoU with HUST and the Schools.

Moreover, the peers learn from the teaching staff that there are many different options to apply for funding for research projects, not only from HUST but also from the government and big companies the university collaborates with.

In summary, the peers appreciate the university's efforts in the further development of its employees and consider the support mechanisms for the continuing professional development of the teaching staff adequate and sufficient.

Criterion 4.3 Funds and equipment

Evidence:

- Self-Assessment Reports
- On-site visit of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the peers:
HUST is a public university and is therefore funded by the national government of Vietnam. The central administration of HUST organizes and delegates a budget for each school and facility, including salaries, and major investments in the infrastructure including among others classrooms and IT equipment and the central library. In each school, a standard committee has to approve the budget annually. In addition, each school is allowed to keep a share of their income from educational co-operations and special technical service agreements. HUST states, it offers modern IT equipment in all classrooms and uses an online student platform named SIS (Student Information System) to manage the e-curriculum, exam grading, class registration, class schedule, exam schedule and other activities. Constant updates of the IT facilities are conducted based on collected feedback of students and stakeholders.

HUST is located at a large campus in a total area of 256,100 m^2 and offers their students lecture halls, offices, laboratories, libraries, computer laboratories, dormitories, a medical center, a cultural hall and a stadium. Each classroom is equipped with modern teaching equipment and Wi-Fi is available on the entire campus for the students, including the

dormitories and libraries. The current main library was opened in 2005 in a five-floor building offering reading rooms, borrowing rooms, multimedia rooms as well as spaces for studying and using the public computers. The entire library literature can be access online. Next to the access to books and journal in the library, an online database provides access domestic documents and new international study material for self-study and research. The library is continuously expanded and also receives donation from various sources. These including books and journal donations as well as additional financial funds, in particular from alumni, entrepreneurs and academics. The library offers leaflets on how to use to library and conducts training courses on effective library use skills for students. On a regular basis, HUST conducts survey on the level of satisfaction of the library. Issues identified by the last survey included problem to locate documents, but the overall satisfaction was above 90%.

In addition, HUST manages its own Medical Center. Students and lecturers can go to the Medical Center for examination and treatment in case of accident and illness.

During the site visit, the experts were introduced to well-equipped laboratories specifically designed for the Mechatronics program specializations (Automatic Devices/Robots and Intelligent Systems). These laboratories support the students' understanding of mechatronic systems - structure, hardware, software and programming. The focus was on the application of automation systems to production processes. The labs meet the needs of potential employers by combining CNC technologies and programming with automatic devices, robots and machines.

In the discussion with the experts, the students are very satisfied with the equipment at HUST including the laboratories. Generally, there are always two advisors for technical support. Overall, they students also appreciate the library as a learning environment for self-study and group activities and access to domestic and international literature. The opening hours between Monday and Friday are until 9 pm while the library is open until 4 pm on Saturdays and Sundays. The students remark, that especially the shorter opening hours are not in agreement with their learning activity during the weekends.

The expert panel confirms that SME and MSE hold enough workspaces and laboratories and that all laboratories are equipped with modern and sophisticated instruments to accommodate the needs of the students as well as the teaching staff in conducting practical training and research. In addition, the current funding allows maintaining the current standard and purchasing further instruments if necessary.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

[…]

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Report
- Module descriptions
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering

Preliminary assessment and analysis of the peers:
The peers observe that the module descriptions contain the necessary information about the persons responsible for each module, the Vietnamese credit points awarded, the intended learning outcomes, the applicability, the admission and examination requirements, the forms of assessment, and details explaining how the final grade is calculated.

However, the peers note that the module descriptions do not make the calculation of the students' total workload and the conversion into ECTS points transparent. Moreover, HUST has to define how many hours of students' workload is required for one ECTS point. This issue is discussed in more detail under criterion 2.2. Furthermore, the module descriptions do not contain any information about the different teaching methods in the individual modules.

It is necessary that HUST submits the complete and latest version of the corresponding module handbooks and makes them accessible for students and teaching staff. One of the things that is missing from the module handbooks is the description of the bachelor theses. They can be found in the study plan, but it is mandatory that they are added to the module handbooks with the aforementioned information.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Diploma for each degree programme
- Sample Diploma Supplement for each degree programme

- Sample Transcript of Records for each degree programme

Preliminary assessment and analysis of the peers:
The peers confirm that the students of all three degree programmes under review are awarded a Diploma and a Diploma Supplement after graduation. The Diploma consists of a Diploma Certificate and a Transcript of Records. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA. The Diploma Supplements are bilingual (Vietnamese and English or Japanese and Vietnamese). For the Joint Degree Program, Nagaoka University and HUST jointly award a diploma. The Diploma Supplement and the Transcript of Records contain almost all necessary information about the respective degree programme. However, some information should be added. The Diploma Supplement must contain detailed information about the intended learning outcomes, the official duration, the access requirements and the grading system of the degree programme. Therefore, the peers urge HUST to include this information in the Diploma Supplement. Furthermore, the peers note that neither the Transcript of Records nor the Diploma Supplement contains the conversion of Vietnamese credits into ECTS. HUST must indicate how many ECTS credits are awarded for every individual degree programme. Therefore, the peers point out that the Transcript of Records needs to list the acquired ECTS points of each course and how many ECTS points are awarded for the whole degree programme. Moreover, the Diploma Supplement needs to follow the European template and needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide. This allows the reader to categorise the individual result.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Reports
- Webpage HUST
- Webpage School of Mechanical Engineering
- Webpage School of Materials Science and Engineering

Preliminary assessment and analysis of the peers:
The auditors confirm that the rights and duties of both HUST and the students are clearly defined and binding. The students receive all relevant course material in the language of the degree programme at the beginning of each semester.

However, the peers notice that the Vietnamese as well as the English websites of the programmes do not include sufficient information. For this reason, the peers expect HUST to update both versions of the websites of the programmes, to align the information on the university's and the School's webpages, to include information about the intended

learning outcomes, study plans, module descriptions, and academic guidelines of each degree programme and make them thus available to all relevant stakeholders.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

[…]

6. Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the self-assessment report, HUST has an extensive quality management system, which is aimed at constantly improving the quality of the degree programmes and the experience of students and faculty. The central unit responsible for quality management is the Center for Quality Assurance (CeQUA). Every year, HUST develops a quality assurance plan on the basis of regular tasks and the university's general quality policy. The individual Schools are obliged to follow these plans and carry out self-assessment tasks such as the revision of the curricula. The process of curriculum development is divided into three major steps. First, at the end of every academic year lecturers of the individual School meet in order to assess and discuss the courses syllabi. The lecturers hereby consider among other things the students' learning results, inspiration from other institutions, and new trends in the technical fields. The second step consists of conducting surveys and analysing the feedback from students, alumni, employers, and other stakeholders. Finally, the School's Scientific Council, which receives the results of surveys and reports from other groups, suggests improvements to the individual programmes. HUST states to carry out all surveys on a regular basis. Alumni, for instance, are asked for their feedback once at the time of their graduation and once a year after their graduation. General student feedback regarding their study experience is collected once per academic year. Teaching evaluations are conducted at the end of each semester for each module. Via an online tool, students can give their feedback anonymously on aspects

such as the teaching quality, the course content and their learning progress. Afterwards, the results of the surveys are sent to the teachers for further improvement of the courses and teaching. In the audit, the peers inquire whether the results of the surveys are also shared and discussed with the students. The programme coordinators explain that students do not receive the survey results. However, students report that while their feedback is not officially discussed, they generally feel that their criticisms are noticed as they have witnessed changes in the curricula. Some students, for example, who had suggested changes to some modules, were able to see how those changes were implemented subsequently. Generally, students indicate to be satisfied with the programmes to be accredited and confirm that the programmes are very demanding but feasible. The peers are glad to hear that students are generally satisfied with the programmes and that their feedback seems to be recognized. However, to ensure a closed feedback loop, the peers agree that the results of all teaching and student evaluations have to be shared with the students. Furthermore, the peers learn that there is no formal definition of how teaching and student evaluations are conducted and how the results are processed. Therefore, all steps of the evaluations have to be formally and bindingly recorded in order to ensure that the teaching evaluation is organised in such a way that students receive feedback of the results. In addition to including students in the feedback loop, the formal paper should also address the mechanism for handling complaints to ensure that all students' responses are formally processed.

HUST also regularly consults the industry for the assessment and development of the programmes. In extensive surveys, companies are asked among other things about changes in the labour market, expected qualifications of the graduates, and their satisfaction with interns and graduates from HUST. On this basis, the Board of Deans discusses whether the curricula and the learning objectives of the individual programmes need to be revised. In the audit discussions, the industry partners report to be satisfied with the students from HUST, especially in terms of their work ethic. Furthermore, the industry partners confirm that their suggestions are generally adopted by HUST. The peers appreciate that HUST has a rather close relationship with the industry partners and regularly collects feedback from them. Yet, they see potential for improvement in the systematic procedure of acquiring and processing the feedback from industry partners. Since the individual steps of the procedure are not formalized or carried out systematically, the peers believe that more accurate feedback would be received when carried out on an institutional level. The peers therefore recommend to introduce institutionally organized mechanisms to improve the

systematic analysis of the industry's feedback and to gain a wider overview of the industry's feedback.

In conclusion, the peers agree that HUST's quality management ensures a continuous assessment and improvement of the programmes to be accredited that involves all stakeholders. However, the peers identify a few deficits. Thus, a closed feedback loop must be implemented and formalized. Secondly, it is recommended to introduce an institutional mechanism to collect and process the industry's feedback.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

[…]

D Additional Documents

No additional documents are needed.

E Comment of the Higher Education Institution

The institution does not submit a statement.

F Summary: Peer recommendations (28.02.2023)

Taking into account the additional information and the comments given by HUST the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**
Ba Advanced programme in Mechatronics Engineering	With requirements for one year	30.09.2028
Ba Mechatronics Engineering (JOINT programme with Nagaoka University)	With requirements for one year	30.09.2028
Ba Advanced programme in Materials Science and Engineering	With requirements for one year	30.09.2028

Requirements

A 1. (ASIIN 2.1) Credits have to be awarded to all compulsory modules of the curriculum and the workload has to be determined accordingly.

A 2. (ASIIN 2.2) Define how many hours of students' workload is required for one ECTS point.

A 3. (ASIIN 5.1) The module descriptions need to include the correct information about the teaching methods, the students' workload and the awarded credits (Vietnamese Credits and ECTS).

A 4. (ASIIN 5.1) Ensure that the latest version of the module descriptions of the bachelor theses is made accessible for students and teaching staff.

A 5. (ASIIN 5.2) The Transcript of Records needs to list the acquired ECTS points of each course and how many ECTS points are awarded for the whole degree programme.

The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

A 6. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the intended learning outcomes, the official duration, the access requirements and the grading system of the degree programme.

A 7. (ASIIN 5.3) Make the information about the degree programmes (Joint programme, study plans, module descriptions, intended learning outcomes, etc.) available to all stakeholders e.g. by publishing them on the Faculty's webpage.

A 8. (ASIIN 6) The teaching evaluation is to be organised in such a way that a feedback of the results to the students is ensured.

A 9. (ASIIN 3) Disability measures and compensations for disabled students must be implemented.

Recommendations for all programmes

E 1. (ASIIN 2.2) It is recommended to establish a system to monitor the actual student workload in the individual courses.

E 2. (ASIIN 6) It is recommended to implement a formalized system that allows a regular feedback from the industrial and governmental partners on the curriculum of the study programme, e.g. in form of a multi stakeholder advisory board (i.e. representatives from industry, Land Users NGOs, governmental institutions)

E 3. (ASIIN 1.3) It is recommended that the title "Advanced" should not only indicate English-language courses but also advanced course content

E 4. (ASIIN 1.1, 1.3) It is recommended to strengthen the soft skills of the students, in particular public speaking, communication, team work and project management skills, e.g. through designated coursework or integration into existing coursework.

Recommendations for Ba Mechatronics Advanced programme & Ba Mechatronics Joint programme

E 5. (ASIIN 1.1, 1.3) It is recommended to differentiate both programmes from a regular mechanical engineering programme.

G Comment of the Technical Committees 01 Mechanical Engineering, 02- Electrical Engineering and 02 – Materials Science, Physical Technologies (17.03.2023)

Technical Committee 01 – Mechanical Engineering/Process Engineering (06.03.2023)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows he assessment of the peers without any changes.

The Technical Committee 01 – Mechanical Engineering/Process Engineering recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Advanced programme in Mechatronics Engineering	With requirements for one year	30.09.2028
Ba Mechatronics Engineering (JOINT programme with Nagaoka University)	With requirements for one year	30.09.2028

Technical Committee 02 – Electrical Engineering/Information Technology (06.03.2023)

Assessment and analysis for the award of the ASIIN seal:

The committee members discuss the case and follow the assessment of the peers. They recommend, however, arranging the requirements in the order of the ASIIN criteria.The

Technical Committee 02 – Electrical Engineering/Information Technology recommends the award of the seals as follows:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**
Ba Advanced programme in Mechatronics Engineering	With requirements for one year	30.09.2028
Ba Mechatronics Engineering (JOINT programme with Nagaoka University)	With requirements for one year	30.09.2028

Technical Committee 05 – Materials Science, Physical Technologies (17.03.2023)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the procedure and follows he assessment of the peers without any changes.

The Technical Committee 05 – Materials Science, Physical Technologies recommends the award of the seals as follows:

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**
Ba Advanced programme in Materials Science and Engineering	With requirements for one year	30.09.2028

H Decision of the Accreditation Commission (24.03.2023)

Assessment and analysis for the award of the subject-specific ASIIN seal:

The Accreditation Commission discusses the accreditation procedure and decides to rewrite A. 1 to specify that it only affects the Joint Program. It also rewrites E. 3. to make it more specific. With regard to the remaining requirements and recommendations, the AC follows the assessment of the peers and TCs without any changes.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation
Ba Advanced programme in Mechatronics Engineering	With requirements for one year	30.09.2028
Ba Mechatronics Engineering (JOINT programme with Nagaoka University)	With requirements for one year	30.09.2028
Ba Advanced programme in Materials Science and Engineering	With requirements for one year	30.09.2028

Requirements

For Ba Mechatronics Joint programme

A 1. (ASIIN 2.1) Credits have to be awarded to the Japanese Language courses and the workload has to be determined accordingly.

For all Programmes

A 2. (ASIIN 2.2) Define how many hours of students' workload is required for one ECTS point.

A 3. (ASIIN 3) Disability measures and compensations for disabled students must be implemented.

A 4. (ASIIN 5.1) The module descriptions need to include the correct information about the teaching methods, the students' workload and the awarded credits (Vietnamese Credits and ECTS).

A 5. (ASIIN 5.1) Ensure that the latest version of the module descriptions of the bachelor theses is made accessible for students and teaching staff.

A 6. (ASIIN 5.2) The Transcript of Records needs to list the acquired ECTS points of each course and how many ECTS points are awarded for the whole degree programme. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

A 7. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the intended learning outcomes, the official duration, the access requirements and the grading system of the degree programme.

A 8. (ASIIN 5.3) Make the information about the degree programmes (Joint programme, study plans, module descriptions, intended learning outcomes, etc.) available to all stakeholders e.g. by publishing them on the Faculty's webpage.

A 9. (ASIIN 6) The teaching evaluation is to be organised in such a way that a feedback of the results to the students is ensured.

Recommendations for all programmes

E 1. (ASIIN 2.2) It is recommended to establish a system to monitor the actual student workload in the individual courses.

E 2. (ASIIN 6) It is recommended to implement a formalized system that allows a regular feedback from the industrial and governmental partners on the curriculum of the study programme, e.g. in form of a multi stakeholder advisory board (i.e. representatives from industry, Land Users NGOs, governmental institutions)

E 3. (ASIIN 1.3) As the title composition "advanced" only refers to the English-language courses, it is recommended to avoid it.

E 4. (ASIIN 1.1, 1.3) It is recommended to strengthen the soft skills of the students, in particular public speaking, communication, team work and project management skills, e.g. through designated coursework or integration into existing coursework.

Recommendations for Ba Mechatronics Advanced programme & Ba Mechatronics Joint programme

E 5. (ASIIN 1.1, 1.3) It is recommended to differentiate both programmes from a regular mechanical engineering programme.

I Fulfilment of Requirements (22.03.2024)

Comments of the peers and the Technical Committees (01.03.2024)

Requirements

For Ba Mechatronics Joint Programme

A 1. (ASIIN 2.1) Credits have to be awarded to the Japanese Language courses and the workload has to be determined accordingly.

Initial Treatment	
Experts	Fulfilled Justification: The Japanese Language courses have been assigned 17 ECTS credits by the university.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

For all degree programmes

A 2. (ASIIN 2.2) Define how many hours of students' workload is required for one ECTS point.

Initial Treatment	
Experts	fulfilled Justification: HUST has determined that one ECTS credit is equivalent to 30 hours of student workload, including classroom learning, practice, experiments, internships, and self-study time.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 3. (ASIIN 3) Disability measures and compensations for disabled students must be implemented.

Initial Treatment	
Experts	Fulfilled Justification: HUST has implemented several practical measures along with procedures to identify and assist the needs of disabled students.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 4. (ASIIN 5.1) The module descriptions need to include the correct information about the teaching methods, the students' workload and the awarded credits (Vietnamese and ECTS).

Initial Treatment	
Experts	Fulfilled Justification: The module descriptions have been adjusted according to the requirement.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 5. (ASIIN 5.1) Ensure that the latest version of the module descriptions of the general education modules is made accessible for students and teaching staff.

Initial Treatment	
Experts	Fulfilled Justification: The most recent editions of the module handbooks are now available on the school's website.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 6. (ASIIN 5.2) The Transcript of Records needs to list the acquired ECTS points of each course and how many ECTS points are awarded for the whole degree programme. The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Initial Treatment	
Experts	Fulfilled Justification: HUST has issued a process to change the Transcript of Records and the Diploma Supplement according to the 'Regulations on main content recorded on diploma and appendix of higher education diploma'.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 7. (ASIIN 5.2) Ensure that the Diploma Supplement contains detailed information about the intended learning outcomes, the official duration, the access requirements and the grading system of the degree programme.

Initial Treatment	
Experts	Fulfilled Justification: HUST has issued a process to change the Transcript of Records and the Diploma Supplement according to the 'Regulations on main content recorded on diploma and appendix of higher education diploma'.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 8. (ASIIN 5.3) Make the information about the degree programmes (study plans, module descriptions, intended learning outcomes, etc.) available to all stakeholders e.g. by publishing them on the School's webpage.

Initial Treatment	
Experts	Fulfilled Justification: The information is now available on the websites of the degree programmes.
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

A 9. (ASIIN 6) The teaching evaluation is to be organised in such a way that a feedback of the results to the students is ensured.

Initial Treatment	
Experts	Fulfilled Justification: A regulation regarding the evaluation of teaching has been developed. According to Article 5, Sentence 7, "Survey results need to be officially announced to survey participants.".
TC 01	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.
TC 02	fulfilled Justification: The TC follows the assessment of the experts.
TC 05	fulfilled Justification: The Technical Committee follows the assessment of the auditors without any changes.

Decision of the Accreditation Committee (22.03.2024)

The Accreditation Commission discusses the procedure and mostly agrees with the assessment of the experts and the technical committees. However, the Accreditation Commission disagrees with the assessment of requirements 6 and 7. The Diploma Supplement and the Transcript of Records have not yet been submitted. Therefore, the Accreditation Commission considers that these requirements are not yet fulfilled.

The Accreditation Commission decides to award the following seals:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Advanced Programme in Mechatronics Engineering	Requirements 6,7 not fulfilled	-	6 months prolongation
Ba Mechatronics Engineering (Joint Programme with Nagaoka University)	Requirements 6,7 not fulfilled	-	6 months prolongation
Ba Advanced programme in Materials Science and Engineering	Requirements 6,7 not fulfilled		6 months prolongation

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Mechatronics Engineering (Advanced Programme):

Table 1.3 Learning outcomes of APME

PLO1: Solid technical knowledge base to adapt well to various tasks in a wide field of mechatronics, focusing on the ability to apply knowledge to participate in designing, evaluating solutions, mechatronic systems /processes /products.	
	PLO1.1: Ability to apply basic mathematical and scientific knowledge to participate in the design and calculation of mechatronic systems / processes / products.
	PLO1.2: The ability to apply the basic knowledge of the discipline to participate in the analysis of mechatronic systems / processes / products.
	PLO1.2: 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 death.
PLO2: Professional skills and personal qualities needed to succeed in the career	
	PLO2.1: Skills in problem detecting, analyzing and solving in mechatronics engineering field.
	PLO2.2: Skills in systematic and critical thinking.
	PLO2.3: Activeness, seriousness, perseverance.
	PLO2.4: Ability in applying and discovering the knowledge
	PLO2.5: Ethics and professional responsibilities.
	PLO2.6: Understanding contemporary issues and lifelong learning
PLO3: Social skills needed to work effectively in multidisciplinary teams and in an international environment	
	PLO3.1: Skills for cooperation, organization and teamwork.
	PLO3.2: Communication skills through writing, presentation, discussion, effectively using modern tools and media.
	PLO3.3: Skills in using English at work by getting TOEIC (650) score according to the regulations of the university.

PLO4: Ability to participate in the implementing, testing and developing of Mechatronics systems /processes /products /technical solutions in fields of mechatronics engineering in current social and environmental context	
	PLO4.1: Participate in the design and simulation of the deployment process.
	PLO4.2: Join the hardware manufacturing process and Join the software deployment process
	PLO4.3: Participate in the design and simulation of the deployment process and Participate in inspection, verification, approval and certification
	PLO4.4: Awareness of the close relationship and influence of Mechatronic technical solutions to economic, social and environmental factors in the context of globalization
	PLO4.5: The ability to identify problems and form ideas of technical solutions, the ability to participate in the construction of projects related to mechatronics.
	PLO4.6: Capacity to participate in designing mechatronic systems /processes /products /technical solutions.
	PLO4.7: Capacity to participate in implementing /manufacturing /implementing systems/ processes /products /Mechatronic technical solutions
PLO5: Having political qualities, a sense of service to the people, good health to meet the equirements of the national construction and defense	
	PLO5.1: Having political theoretical qualifications under the general regulations program of the Ministry of Education and Training.
	PLO5.2: Having a physical education certificate and certificate of national defense and security according to the regular for the general Bachelor program from the Ministry of Education and Training.

The following **curriculum** is presented:

TT	MÃ SỐ	TÊN HỌC PHẦN	KHỐI LƯỢNG (TC)	KỲ HỌC THEO KẾ HOẠCH CHUẨN										
				1	2	3	4	5	6	7	8	9	10	11
Lý luận chính trị + Pháp luật đại cương *(Laws and Politics)*			**13**											
1	SSH1111	Triết học Mác-Lênin	3(2-1-0-6)	3										
2	SSH1121	Kinh tế chính trị Mác-Lênin	2(2-0-0-4)		2									
3	SSH1151	Tư tưởng Hồ Chí Minh *(Ho-Chi-Minh's Thought)*	2(2-0-0-4)				2							
4	SSH1131	Chủ nghĩa xã hội khoa học	2(2-0-0-4)				2							
5	SSH1141	Lịch sử Đảng Cộng sản Việt Nam	2(2-0-0-4)				2							
6	EM1170	Pháp luật đại cương (General Law)	2(2-0-0-4)	2										
Giáo dục thể chất (5TC) *(Physical Education)*														
7	PE1014	Lý luận thể dục thể thao *(Theory in Sport)*	0(0-0-2-0)											
8	PE1024	Bơi lội *(Swimming)*	0(0-0-2-0)											
9	PE1030	Tự chọn thể dục 1 *(Elective course 1)*	0(0-0-2-0)											
10	PE2010	Tự chọn thể dục 2 *(Elective course 2)*	0(0-0-2-0)											
11	PE2020	Tự chọn thể dục 3 *(Elective course 3)*	0(0-0-2-0)											
Giáo dục Quốc phòng - An ninh *(Military Education)*														
12	MIL1110	Đường lối quân sự của Đảng *(Vietnam Communist Party's Direction on the National Defense)*	0(3-0-0-6)											
13	MIL1120	Công tác quốc phòng, an ninh *(Introduction to the National Defense)*	0(3-0-0-6)											
14	MIL1130	QS chung và chiến thuật, kỹ thuật bắn súng tiểu liên AK (CKC) *(General Military Education)*	0(3-2-0-8)											

Tiếng Anh *(English)*			**6**											
15	FL1100	Tiếng Anh I *(English I)*	3(0-6-0-6)	3										
16	FL1101	Tiếng Anh II *(English II)*	3(0-6-0-6)		3									
Khối kiến thức Toán và Khoa học cơ bản *(Mathematics and Basic Sciences)*			**32**											
17	MI1016	Giải tích I *(Calculus I)*	4(3-2-0-8)	4										
18	MI1026	Giải tích II *(Calculus II)*	4(3-2-0-8)		4									
19	MI1046	Phương trình vi phân và chuỗi *(Differential Equations and Series)*	3(2-2-0-6)			3								
20	MI1036	Đại số *(Algebra)*	4(3-2-0-8)	4										
21	ME2030	Cơ khí đại cương *(General Mechanical Engineering)*	2(2-1-0-4)			2								
22	PH1016	Vật lý đại cương I *(Physics I)*	4(2-2-1-8)		4									
23	PH1026	Vật lý đại cương II *(Physics II)*	4(2-2-1-8)			4								
24	IT1016	Tin học đại cương *(Introduction to Computer Science)*	3(2-1-2-6)		3									
25	MI2110	Phương pháp tính và Matlab (Calculations Methods and Matlab)	3(2-0-2-6)				3							
26	ME2011	Đồ họa kỹ thuật I *(Engineering Graphics I)*	3(3-1-0-6)			3								
Cơ sở và cốt lõi ngành *(Basic and Core of Engineering)*			**47**											
27	ME2201	Đồ họa kỹ thuật II *(Engineering Graphics II)*	2(2-1-0-4)				2							
28	ME2100	Nhập môn Cơ điện tử *(Introduction to Mechatronics Engineering)*	3(2-1-2-6)					3						
29	EE2012	Kỹ thuật điện *(Electrical Engineering)*	2(2-1-0-4)				2							
30	ET2012	Kỹ thuật điện tử *(Electronic Engineering)*	2(2-1-0-4)				2							
31	ME2112	Cơ học kỹ thuật I *(Engineering Mechanics I)*	2(2-1-0-4)			2								
32	ME2101	Sức bền vật liệu I *(Strength of Materials I)*	2(2-1-0-4)			2								
33	ME2211	Cơ học kỹ thuật II *(Engineering Mechanics 1I)*	3(2-2-0-6)				3							
34	ME2202	Sức bền vật liệu II *(Strength of Materials II)*	2(2-1-0-4)				2							

35	ME2203	Nguyên lý máy *(Theory of Machines)*	2(2-0-1-4)					2							
36	EE3359	LT Điều khiển tự động *(Automation Control Theory)*	3(3-1-0-6)					3							
37	MSE2228	Vật liệu học *(Materials Science)*	2(2-0-1-4)					2							
38	ME3101	Chi tiết máy *(Machine Element Design)*	2(2-0-1-4)						2						
39	ME3072	Kỹ thuật đo *(Measurement Techniques)*	2(2-0-1-4)						2						
40	IT3011	Cấu trúc dữ liệu và thuật toán *(Data Structures and Algorithms)*	2(2-1-0-4)					2							
41	ME3205	Công nghệ chế tạo máy *(Manufacturing Technology)*	3(3-0-1-6)						3						
42	ME3209	Robotics	3(3-1-0-6)						3						
43	HE2012	Kỹ thuật nhiệt *(Thermal Engineering)*	2(2-0-1-4)					2							
44	ME3213	Kỹ thuật lập trình trong CĐT *(Progamming Engineering in Mechatronic)*	3(2-2-0-6)						3						
45	TE3600	Kỹ thuật thủy khí *(Fluid Engineering)*	2(2-1-0-4)						2						
46	ME3215	Cơ sở Máy CNC *(Fundamental of CNC)*	3(3-0-1-6)						3						
		Tổng số tín chỉ													
Kiến thức bổ trợ xã hội *(Soft skills)*			**9**												
47	EM1010	Quản trị học đại cương *(Introduction to Management)*	2(2-0-0-4)												
48	EM1180	Văn hóa kinh doanh và tinh thần khởi nghiệp *(Business Culture and Entrepreneurship)*	2(2-1-0-4)												
49	ED3280	Tâm lý học ứng dụng *(Applied Psychology)*	2(1-2-0-4)												
50	ED3220	Kỹ năng mềm *(Soft Skills)*	3(2-2-0-6)												
51	ET3262	Tư duy công nghệ và thiết kế kỹ thuật *(Technology and Technical Design Thinking)*	2(1-2-0-4)												
52	ME3123	Thiết kế mỹ thuật công nghiệp *(Industrial Design)*	2(1-2-0-4)												
53	ME2021	Technical Writing and Presentation	3(2-2-0-6)							3					
		Tổng số tín chỉ													

Mô đun: Robot và Hệ thống cơ điện tử thông minh *(Module : Robot and Inteligent mechatronics system)*			**17**											
53	IT4162	Vi xử lý *(Microprocessor)*	2(2-1-0-4)						2					
54	ME4511	Cảm biến & xử lý tín hiệu *(Sensor and signal processing)*	2(2-1-0-4)				2							
55	ME4604	Thực tập xưởng HTCĐTTM *(Workshop practical)*	2(0-0-4-4)			2								
56	ME4181	Phương pháp phần tử hữu hạn *(Finite element method)*	2(2-1-0-4)				2							
57	ME4506	ĐA TKHT Cơ khí- CĐTTM *(Mechanical design project 1)*	3(0-0-6-6)						3					
58	ME4508	Giao diện người máy *(Human machine interface)*	2(2-1-0-4)						2					
59	ME4509	Xử lý ảnh trong CĐT *(Image processing in Mechatronics)*	2(2-1-0-4)						2					
60	ME4512	Robot tự hành *(Autonomous Robot)*	2(2-1-0-4)						2					
Mô đun: Thiết bị tự động *(Module:Automation equipment)*			**17**											
53	IT4162	Vi xử lý *(Microprocessor)*	2(2-1-0-4)						2					
54	ME4511	Cảm biến & xử lý tín hiệu *(Sensor and signal processing)*	2(2-1-0-4)				2							
55	ME4602	Thực tập xưởng TBTĐ *(Workshop practical)*	2(0-0-4-4)			2								
56	ME4181	Phương pháp phần tử hữu hạn *(Finite element method)*	2(2-1-0-4)				2							
57	ME4504	ĐA TKHT Cơ khí- TBTĐ *(Mechanical design project 1)*	3(0-0-6-6)						3					
58	ME4501	PLC và mạng công nghiệp *(PLC and industrial System)*	2(2-1-0-4)						2					
59	ME4082	Công nghệ CNC *(CNC Technology)*	2(2-1-0-4)						2					
60	ME4507	Robot Công nghiệp *(Industrial Robot)*	2(2-1-0-4)						2					
Đồ án nghiên cứu khoa học *(Thesis)*			**8**											

61	ME499x	Đồ án nghiên cứu	8(0-0-16-16)								2				
		Tổng số tín chỉ toàn phần	**132**												

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Mechatronics (Joint Programme Nagaoka University):

Table 1.7 Learning outcomes of ME-NUT program

PLO1: Solid technical knowledge base to adapt well to various tasks in a wide field of mechatronics, focusing on the ability to apply knowledge to participate in designing, evaluating solutions, mechatronic systems /processes /products.	
	PLO1.1: Ability to apply basic mathematical and scientific knowledge to participate in the design and calculation of mechatronic systems / processes / products.
	PLO1.2: The ability to apply the basic knowledge of the discipline to participate in the analysis of mechatronic systems / processes / products.
	PLO1.2: 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 death.
PLO2: Professional skills and personal qualities needed to succeed in the career	
	PLO2.1: Skills in problem detecting, analyzing and solving in mechatronics engineering field.
	PLO2.2: Skills in systematic and critical thinking.
	PLO2.3: Activeness, seriousness, perseverance.
	PLO2.4: Active, creative and serious.
	PLO2.5: Ethics and professional responsibilities.
	PLO2.6: Understanding contemporary issues and lifelong studying awareness.
PLO3: Social skills needed to work effectively in multidisciplinary teams and in an international environment	
	PLO3.1: Skills for cooperation, organization and teamwork.
	PLO3.2: Communication skills through writing, presentation, discussion, effectively using modern tools and media.
	PLO3.3: Skills in using Japanese (at least N3) and English (Toeic 385)
PLO4: Ability to participate in the implementing, testing and developing of Mechatronics systems /processes /products /technical solutions in fields of mechatronics engineering in current social and environmental context	

	PLO4.1: Awareness of the close relationship between information technology solutions with economic, social and environmental factors in the globalized world.
	PLO4.2: Identify problems and formulate ideas of information technology solutions, participate in building information technology projects.
	PLO4.3: Participate in designing information technology systems, products and solutions.
	PLO4.4: Participating in implementing and deploying information technology systems, products and solutions
	PLO4.5: Exploiting and maintaining information technology systems, products and solutions.
PLO5: Having political qualities, a sense of service to the people, good health to meet the requirements of the national construction and defense	
	PLO5.2: Having political theoretical qualifications under the general regulations program of the Ministry of Education and Training.
	PLO5.3: Having a physical education certificate and certificate of national defense and security according to the regular for the general Bachelor program from the Ministry of Education and Training.

The following **curriculum** is presented:

Course list & Schedule for ME-NUT Twinning Program

Danh mục học phần và kế hoạch học tập cho chương trình ME-NUT

TT	MÃ SỐ ID CODE	TÊN HỌC PHẦN COURSE	KHỐI LƯỢNG (TC) CREDIT NUMBER	NORMAL ACADEMIC SEMESTER KỲ HỌC THEO KẾ HOẠCH CHUẨN										
				1	2	3	4	5	6	7	8	9	10	11
BẬC CỬ NHÂN - BACHELOR														
General Education Courses **Lý luận chính trị + Pháp luật đại cương** **Political Theory + General Law**			**13**											
1	SSH1111Q	Triết học Mác – Lênin Philosophy of Marxism-Leninism	3(3-0-0-6)	3										
2	SSH1121Q	Kinh tế chính trị Mác – Lênin Political Economy of Marxism-Leninism	2(2-0-0-4)		2									
3	SSH1131Q	Chủ nghĩa xã hội khoa học Science socialism	2(2-0-0-4)				2							
4	SSH1141Q	Lịch sử Đảng Cộng sản Việt Nam History of Vietnamese Communist Party	2(2-0-0-4)					3						
5	SSH1151Q	Tư tưởng Hồ Chí Minh Ho-Chi-Minh's Thought	2(2-0-0-4)			2								
6	EM1170Q	Pháp luật đại cương General Law	2(2-0-0-4)	2										
Giáo dục thể chất (5TC) **Physical Education (5 credits)**														
7	PE1014	Lý luận thể dục thể thao (bắt buộc) Sports theory and reasoning (requirement)	1(0-0-2-0)											
8	PE1024	Bơi lội (bắt buộc) Swimming (requirement)	1(0-0-2-0)											
9	Tự chọn trong danh mục Election from the list	Tự chọn thể dục 1 Election exercise 1	1(0-0-2-0)											
10		Tự chọn thể dục 2 Election exercise 2	1(0-0-2-0)											
11		Tự chọn thể dục 3 Election exercise 3	1(0-0-2-0)											
Giáo dục Quốc phòng - An ninh (165 tiết) **National Defense Education (165 class hours)**														
11	MIL1110Q	Đường lối quân sự của Đảng Vietnam Communist Party's Direction on the National Defense	0(3-0-0-6)											

12	MIL1120Q	Công tác quốc phòng-an ninh Introduction to the National Defense	0(3-0-0-6)											
13	MIL1130Q	QS chung và KCT bắn súng AK General Military Education	0(3-0-0-6)											
Ngoại ngữ (tiếng Anh + tiếng Nhật) Foreign Languages (English + Japanese language)														
Tiếng Anh - English			**6**											
14	FL1100Q	Tiếng Anh 1 (A1.1) English 1 (A1.1)	4(0-8-0-8)	4										
15	FL1101Q	Tiếng Anh 2 (A1.2) English 2 (A1.2)	4(0-8-0-8)		4									
16	QT1031	Tiếng Anh 3 (A2.1)* English 3 (A2.1)*	4(0-8-0-8)			4								
17	QT1041	Tiếng Anh 4 (A2.2)* English 4 (A2.2)*	4(0-8-0-8)				4							
Tiếng Nhật (*) - Japanese language			**12 (+8)***											
18	QT0112	Tiếng Nhật 1 (N5) – 270 tiết Japanese Language 1 (N5) – 270 class hours	3 (+2)	3										
19	QT0122	Tiếng Nhật 2 (N4) – 270 tiết Japanese Language 2 (N4) – 270 class hours	3 (+2)		3									
20	QT1112	Tiếng Nhật 3 (N3) – 270 tiết Japanese Language 3 (N3) – 270 class hours	3 (+2)			3								
21	QT1122	Tiếng Nhật 4 (N3) – 270 tiết Japanese Language 4 (N3) – 270 class hours	3 (+2)				3							
22	QT1132(x)	Tiếng Nhật 5 (N2) – 270 tiết Japanese Language 5 (N2) – 270 class hours	(5)											
Khối kiến thức Toán và Khoa học cơ bản Math. and Sciences			**32**											
23	MI1111Q	Giải tích I Calculus I	4(3-2-0-8)	4										
24	MI1121Q	Giải tích II Calculus II	3(2-2-0-6)		3									
25	MI1131Q	Giải tích III Calculus III	3(2-2-0-6)			3								
26	MI1141Q	Đại số Algebra	4(3-2-0-8)	4										
27	ME2030Q	Cơ khí đại cương Introduction to Manufacturing Engineering	2(2-1-0-4)			2								
28	PH1110Q	Vật lý đại cương I Physics I	3(2-1-1-6)		3									

29	PH1120Q	Vật lý đại cương II Physics II	3(2-1-1-6)			3								
30	IT1110Q	Tin học đại cương Introduction to Informatics	4(3-1-1-8)		4									
31	MI2110Q	Phương pháp tính và Matlab (3TC) Calculation Methods and Matlab	3(2-0-2-6)				3							
32	ME2011Q	Đồ họa kỹ thuật I Engineering Graphics I	3(3-1-0-6)			3								
Cơ sở và cốt lõi ngành **Basic and Core of Engineering**			**47**											
33	ME2201Q	Đồ họa kỹ thuật II Engineering Graphics II	2(2-1-0-4)				2							
34	ME2000Q	Nhập môn Cơ điện tử Introduction to Mechatronics	3(2-1-1-6)					3						
35	EE2012Q	Kỹ thuật điện Fundamentals of Electrical Engineering	2(2-1-0-4)				2							
36	ET2012Q	Kỹ thuật điện tử Electronic Engineering	2(2-1-0-4)				2							
37	ME2112Q	Cơ học kỹ thuật I Engineering Mechanics I	2(2-1-0-4)			2								
38	ME2101Q	Sức bền vật liệu I Strength of Materials I	2(2-1-0-4)			2								
39	ME2211Q	Cơ học kỹ thuật II Engineering Mechanics II	3(2-2-0-6)				3							
40	ME2202Q	Sức bền vật liệu II Strength of Materials II	2(2-1-0-4)				2							
41	ME2203Q	Nguyên lý máy Theory of Machines	2(3-0-1-6)					2						
42	EE3359Q	Lý thuyết khiển tự động Automatic Control Theory	3(3-1-0-6)					3						
43	MSE2228Q	Vật liệu học Materials Science	2(2-0-1-4)					2						
44	ME3101Q	Chi tiết máy Machinery Designs	2(2-0-1-4)						2					
45	ME3072Q	Dung sai và kỹ thuật đo Tolerances and Measurement Techniques	2(2-1-0-4)						2					
46	IT3011Q	Cấu trúc dữ liệu và thuật toán Data Structures and Algorithms	2(2-1-0-4)					2						
47	ME3205Q	Công nghệ chế tạo máy Manufacturing Technology	3(3-0-0-6)						3					
48	ME3209Q	Robotics Robotics	3(3-1-0-6)						3					
49	HE2012Q	Kỹ thuật nhiệt Thermal engineering	2(2-0-1-4)					2						
50	ME3213Q	Kỹ thuật lập trình trong CĐT Programming for Mechatronic Systems	3(2-2-0-6)						3					
51	TE3600Q	Kỹ thuật thủy khí Fluid Engineering	2(2-0-1-4)						2					

52	ME3215Q	Cơ sở Máy CNC Fundamentals of CNC machines	3(3-0-1-6)						3						
Kiến thức bổ trợ xã hội **Soft skill Courses**			**9**												
53	EM1010Q	Quản trị học đại cương Introduction to Management	2(2-1-0-4)						2						
54	EM1180Q	Văn hóa kinh doanh và tinh thần khởi nghiệp Business Culture and Entrepreneurship	2(2-1-0-4)							2					
55	TEX3123Q	Thiết kế mỹ thuật công nghiệp Industrial Design	2(2-1-0-4)								2				
56	ME2021Q	Technical Writing and Presentation Skill	3(2-2-0-6)				3								
Tự chọn theo Modul (định hướng ứng dụng) **Selective Concentration Courses**			**17**												
Mô đun 1: Hệ thống sản xuất tự động ***Modul 1: Automatic production system***															
57	IT4162Q	Vi xử lý *Microprocessor*	2(2-1-0-4)							2					
58	ME4511Q	Cảm biến & xử lý tín hiệu *Sensor and signal processing*	2(2-1-0-4)							2					
59	ME4601Q	Thực tập xưởng Hệ thống SXTĐ *Workshop practical*	2(0-0-4-4)				2								
60	ME4181Q	Phần tử hữu hạn *Finite element method*	2(2-1-0-4)					2							
61	ME4503Q	ĐA TKHT Cơ khí-SXTĐ *Mechanical design project 1*	3(0-0-6-6)							3					
62	ME4501Q	PLC và mạng công nghiệp *PLC & Industrial Networks*	2(2-0-1-4)							2					
63	ME4082Q	Công nghệ CNC *CNC Technology*	2(2-1-0-4)							2					
64	ME4112Q	Tự động hóa sản xuất *Automated Manufacturing Systems*	2(2-1-0-4)							2					
Mô đun 2: Robot ***Modul 2: Robot***															
57	IT4162Q	Vi xử lý *Microprocessor*	2(2-1-0-4)							2					
58	ME4511Q	Cảm biến & xử lý tín hiệu *Sensor and signal processing*	2(2-1-0-4)					2							
59	ME4603Q	Thực tập xưởng Robot *Workshop practical*	2(0-0-4-4)				2								
60	ME4181Q	Phần tử hữu hạn *Finite element method*	2(2-1-0-4)					2							
61	ME4505Q	ĐA TKHT Cơ khí- Robot *Mechanical design project 1*	3(0-0-6-6)							3					

62	ME4508Q	Giao diện người máy *Human Manchine Interface*	2(2-1-0-4)							2					
63	ME4509Q	Xử lý ảnh trong CĐT Image in Mechatronic Systems	2(2-1-0-4)							2					
64	ME4512Q	Robot tự hành *Autonomous Robots*	2(2-1-0-4)							2					
Thực tập kỹ thuật và Đồ án tốt nghiệp Cử nhân **Engineering Internship and Bachelor Graduation Project**			**8**												
65	ME4258Q	Thực tập kỹ thuật Engineering Internship	2(0-0-4-4)							2					
66	ME4992Q	Đồ án tốt nghiệp Graduation Project	6(0-0-12-12)								6				
Học phần do giảng viên trường đối tác giảng dạy (Bằng tiếng Nhật) – Do JCT phân công **Advanced Courses (taught by JCT professors in Japanese language)**			**12**	180/360 tiết 180/360 class hours											
J1	QT3112(x)	Nhiệt động lực học (Thermo Dynamics)	30 tiết			X									
J2	QT3122(x)	Cơ kỹ thuật (Engineering Mechanics)	30 tiết			X									
J3	QT4112(x)	Kỹ thuật đo quang (Optical Instrumentation Engineering)	30 tiết				X								
J4	QT4122(x)	Công nghệ thông tin (Information technology)	30 tiết				X								
J5	QT3122(x)	Kỹ thuật & dụng cụ đo (Measurement & Instrumentation)	30 tiết			X									
J6	QT4132(x)	Động lực học chất khí (gas Dynamics)	30 tiết				X								
J7	QT3142(x)	Đo lường (Metrology)	30 tiết			X									
J8	QT3152(x)	Khoa học vật liệu (Material Science)	30 tiết			X									
J9	QT4142(x)	Công nghệ chế tạo máy (Manufacturing Engineering)	30 tiết				X								
J10	QT3162(x)	Cơ học (Mechanic)	30 tiết			X									
J11	QT3172(x)	Thiết lập thí nghiệm & viết báo cáo (Experimentation and Report Writing)				X									
J12	QT4152(x)	Thủy lực (Hydrolics)					X								
		Tổng số tín chỉ toàn phần **Total Credits**	**132++** **(158)**	(+26TC = 8TC tiếng Nhật + 6TC tiếng Anh +12TC do GS Nhật giảng dạy) (+26 Credits = 8 credits Japanese language + 6 credits English + 12 credits Advanced Courses)											

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor's degree programme Materials Science and Engineering (Advanced Programme):

Table 1.3 Learning outcomes of APME

PLO1: Solid technical knowledge base to adapt well to various tasks in a wide field of mechatronics, focusing on the ability to apply knowledge to participate in designing, evaluating solutions, mechatronic systems /processes /products.	
	PLO1.1: Ability to apply basic mathematical and scientific knowledge to participate in the design and calculation of mechatronic systems / processes / products.
	PLO1.2: The ability to apply the basic knowledge of the discipline to participate in the analysis of mechatronic systems / processes / products.
	PLO1.2: 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 death.
PLO2: Professional skills and personal qualities needed to succeed in the career	
	PLO2.1: Skills in problem detecting, analyzing and solving in mechatronics engineering field.
	PLO2.2: Skills in systematic and critical thinking.
	PLO2.3: Activeness, seriousness, perseverance.
	PLO2.4: Ability in applying and discovering the knowledge
	PLO2.5: Ethics and professional responsibilities.
	PLO2.6: Understanding contemporary issues and lifelong learning
PLO3: Social skills needed to work effectively in multidisciplinary teams and in an international environment	
	PLO3.1: Skills for cooperation, organization and teamwork.
	PLO3.2: Communication skills through writing, presentation, discussion, effectively using modern tools and media.
	PLO3.3: Skills in using English at work by getting TOEIC (650) score according to the regulations of the university.
PLO4: Ability to participate in the implementing, testing and developing of Mechatronics systems /processes /products /technical solutions in fields of mechatronics engineering in current social and environmental context	
	PLO4.1: Participate in the design and simulation of the deployment process.
	PLO4.2: Join the hardware manufacturing process and Join the software deployment process

	PLO4.3: Participate in the design and simulation of the deployment process and Participate in inspection, verification, approval and certification
	PLO4.4: Awareness of the close relationship and influence of Mechatronic technical solutions to economic, social and environmental factors in the context of globalization
	PLO4.5: The ability to identify problems and form ideas of technical solutions, the ability to participate in the construction of projects related to mechatronics.
	PLO4.6: Capacity to participate in designing mechatronic systems /processes /products /technical solutions.
	PLO4.7: Capacity to participate in implementing /manufacturing /implementing systems/ processes /products /Mechatronic technical solutions
PLO5: Having political qualities, a sense of service to the people, good health to meet the equirements of the national construction and defense	
	PLO5.1: Having political theoretical qualifications under the general regulations program of the Ministry of Education and Training.
	PLO5.2: Having a physical education certificate and certificate of national defense and security according to the regular for the general Bachelor program from the Ministry of Education and Training.

The following **curriculum** is presented:

TT *(No.)*	MÃ SỐ *(Course ID)*	TÊN HỌC PHẦN *(Course Name)*	KHỐI LƯỢNG (Tín chỉ) *(Credit)*	KỲ HỌC *(Semester)*							
				1	2	3	4	5	6	7	8
BẬC CỬ NHÂN			**132**								
Lý luận chính trị + Pháp luật đại cương *(Laws and politics)*			**13**								
1	SSH1111	Triết học Mác - Lê nin	3(2-1-0-6)	3							
2	SSH1121	Kinh tế chính trị Mác - Lê Nin	2(2-0-0-4)		2						
3	SSH1131	Chủ nghĩa xã hội khoa học	2(2-0-0-4)			2					
4	SSH1141	Lịch sử Đảng cộng sản Việt Nam	2(2-0-0-4)				2				
5	SSH1151	Tư tưởng Hồ Chí Minh (Ho-Chi-Minh's Thought)	2(2-0-0-4)				2				
6	SSH1170	Pháp luật đại cương (General Law)	2(2-0-0-4)					2			
Giáo dục thể chất *(Physical Education)*											

TT (No.)	MÃ SỐ (Course ID)	TÊN HỌC PHẦN (Course Name)	KHỐI LƯỢNG (Tín chỉ) (Credit)	KỲ HỌC (Semester)							
				1	2	3	4	5	6	7	8
7	PE1014	Lý luận TDTT	1(0-0-2-0)	x							
8	PE1024	Bơi lội	1(0-0-2-0)		x						
9		Giáo dục thể chất C	1(0-0-2-0)			1					
10		Giáo dục thể chất D	1(0-0-2-0)				x				
11		Giáo dục thể chất E	1(0-0-2-0)					x			
Giáo dục Quốc phòng - An ninh (165 tiết) (Military Education)											
12	MIL1110	Đường lối quân sự của Đảng (Vietnam Communist Party's Direction on the National Defense)	3(3-0-0-6)		3						
13	MIL1120	Công tác quốc phòng, an ninh (Introduction to the National Defense)	3(3-0-0-6)	3							
14	MIL1130	QS chung và chiến thuật, kỹ thuật bắn súng tiểu liên AK (CKC) (General Military Education)	4(3-0-2-8)				4				
Tiếng Anh *(English)*			**6**								
15	FL1114	Grammar for writing	1(1-1-0-4)	1							
16	FL1115	English communication skills 1	1(1-1-0-4)	1							
17	FL1116	Skills integration 1	4(3-3-0-8)	4							
18	FL1117	Foundation writing for IELTS	1(1-1-0-4)	1							
19	FL1118	English communication skills 2	2(2-1-0-4)	2							
20	FL1119	Skills integration 2	4(3-2-0-8)	4							
21	FL1120	IELTS listening 1	2(2-1-0-4)		2						
22	FL1121	IELTS speaking 1	1(1-1-0-4)		1						
23	FL1122	IELTS reading 1	1(1-1-0-4)		1						
24	FL1123	IELTS writing 1	2(2-1-0-4)		2						
25	FL1124	IELTS listening 2	2(2-1-0-4)		2						
26	FL1125	IELTS speaking 2	1(1-1-0-4)		1						
27	FL1126	IELTS reading 2	1(1-1-0-4)		1						
28	FL1127	IELTS writing 2	2(2-1-0-4)		2						
29	FL2016	Writing Skills III	2(2-0-0-4)		2						
Khối kiến thức Toán và Khoa học cơ bản *(Mathematics and basic sciences)*			**32**								

TT (No.)	MÃ SỐ (Course ID)	TÊN HỌC PHẦN (Course Name)	KHỐI LƯỢNG (Tín chỉ) (Credit)	KỲ HỌC (Semester)							
				1	2	3	4	5	6	7	8
30	MI1016	Giải tích I *(Calculus I)*	4(3-2-0-8)	4							
31	MI1026	Giải tích II *(Calculus II)*	4(3-2-0-8)		4						
32	MI1046	Phương trình vi phân và chuỗi	3(2-2-0-6)		3						
33	MI1036	Đại số *(Algebra)*	4(3-2-0-8)	4							
34	PH1016	Vật lý đại cương I *(Physics I)*	4(2-2-1-8)		4						
35	PH1026	Vật lý đại cương II *(Physics II)*	4(3-2-1-8)			4					
36	IT1016	Tin học đại cương *(Introduction to Computer Science)*	3(2-1-2-6)			3					
37	CH1016	Hoá học *(Chemistry)*	4(3-2-1-8)				4				
38	ME2016	Vẽ kỹ thuật I (Technical Drawing I)	2(1-1-0-4)				2				
Cơ sở ngành *(Basic Core of Engineering)*			**48**								
39	MSE1012	Nhập môn kỹ thuật *Introduction to engineering*	2(2-1-0-4)		2						
40	MSE3206	Pha và quan hệ pha *Phases and phase relations*	3(3-1-0-6)			3					
41	MSE3207	Công nghệ vật liệu *Materials Processing*	3(3-0-0-6)				3				
42	MSE3407	Nhiệt động học vật liệu *Thermodynamics of Materials*	3(3-0-0-6)				3				
43	MSE3416	Các quá trình động học trong vật liệu *Kinetic Processes in Materials*	3(3-0-0-6)				3				
44	MSE3417	Hóa học vật liệu *Material chemistry*	2(2-0-0-4)				2				
45	MSE3456	Xử lý số liệu *Analysis of Data*	3(3-0-0-6)				3				
46	MSE3126	Cơ học vật liệu *Mechanics for materials*	3(3-0-0-6)				3				
47	MSE3436	Xác định cấu trúc vi mô *Microstructure Determination*	3(2-1-1-4)					3			

TT (No.)	MÃ SỐ (Course ID)	TÊN HỌC PHẦN (Course Name)	KHỐI LƯỢNG (Tín chỉ) (Credit)	KỲ HỌC (Semester)							
				1	2	3	4	5	6	7	8
48	MSE3427	Tổng hợp vật liệu *Synthesis of Materials*	2(2-0-0-4)					2			
49	MSE3317	Thí nghiệm vật liệu 1 *Materials Laboratory 1*	2(0-0-4-4)				2				
50	MSE4175	Quá trình đông đặc *Solidification Processing*	2(2-0-0-4)					2			
51	MSE3446	Hành vi cơ nhiệt của vật liệu *Thermal-mechanical behavior of materials*	3(2-1-1-6)					3			
52	MSE3447	Tính chất điện tử, quang và từ của vật liệu *Electronic, optical and magnetic properties of Materials*	3(2-2-0-6)					3			
53	MSE4156	Ăn mòn kim loại *Corrosion of Metals*	3(3-0-0-6)					3			
54	MSE3326	Thí nghiệm vật liệu 2 *Materials Laboratory 2*	2(0-0-4-4)					2			
55	MSE4405	*Thiết kế vật liệu Materials Design*	2(2-0-0-4)					2			
56	MSE4407	Vật liệu thông minh *Smart Materials*	2(2-0-0-4)					2			
57	MSE4408	Vật liệu cấu trúc nanô *Nanostructured materials*	2(2-0-0-4)					2			
Kiến thức bổ trợ *(Soft skills)*			**9**			x	x	x	x		
58	EM1180E	Văn hóa kinh doanh và tinh thần khởi nghiệp *(Business Culture and Entrepreneurship)*	2(2-1-0-4)								
59	ED3280E	Tâm lý học ứng dụng *(Applied Psychology)*	2(1-2-0-4)								
60	ED3220E	Kỹ năng mềm *(Soft Skills)*	2(1-2-0-4)								
61	ET3262E	Tư duy công nghệ và thiết kế kỹ thuật *(Technology and Technical Design Thinking)*	2(1-2-0-4)								

TT *(No.)*	MÃ SỐ *(Course ID)*	TÊN HỌC PHẦN *(Course Name)*	KHỐI LƯỢNG (Tín chỉ) *(Credit)*	KỲ HỌC *(Semester)*							
				1	2	3	4	5	6	7	8
62	MSE2024E	Technical Writing and Presentation	3(2-2-0-6)								
Tự chọn			**16**					x	x	x	x
62	MSE4015	Gia công kim loại *Metal Processing*	2(2-0-0-4)								
63	MSE4117	Thiết kế hợp kim kỹ thuật *Design of Enginering Alloys*	2(2-0-0-4)								
64	MSE4118	Vật liệu composite *Composite Materials*	2(2-0-0-4)								
65	MSE4119	Vật liệu năng lượng sạch *Clean energy materials*	2(2-0-0-4)								
67	MSE4651E	Vật liệu vô định hình *Amorphous Materials*	2(2-1-0-4)								
66	MSE4652	Vật liệu chức năng *Functional Materials*	2(2-0-0-4)								
68	MSE4653	Mô phỏng cấp độ nguyên tử *Atomic scale Simulation*	2(2-0-0-4)								
69	MSE4654	Thiết bị điện tử trạng thái rắn *Solid State Electronic Devices*	2(2-0-0-4)								
70	MSE3161E	Tính năng vật liệu trong các môi trường đặc biệt *Materials for extreme conditions*	2(2-0-0-4)								
71	MSE4655	Gốm tiên tiến *Advanced ceramics*	2(2-0-0-4)								
72	MSE4656	Công nghệ bề mặt và màng mỏng *Surface and thin film technology*	2(2-0-0-4)								
73	MSE4657	Công nghệ vật liệu y sinh nanô *Nanobiomateials Technology*	2(2-0-0-4)								
74	MSE4658	Sen-sơ và thiết bị nanô *Nanosensor and devices*	2(2-0-0-4)								

TT (No.)	MÃ SỐ (Course ID)	TÊN HỌC PHẦN (Course Name)	KHỐI LƯỢNG (Tín chỉ) (Credit)	KỲ HỌC (Semester)							
				1	2	3	4	5	6	7	8
75	MSE4659	Công nghệ các-bon nanô *Carbon nanotechnology*	2(2-0-0-4)								
76	MSE3151E	Công nghệ vật liệu tiên tiến *Advanced Materials Processing*	2(2-0-0-4)								
Thực tập và đồ án TN			**8**						x	x	x
77	MSE4095E	Thực tập kỹ thuật	2(0-0-4-4)						2		
78	MSE4999E	Đồ án tốt nghiệp	6(0-0-12-12)								6
79	MSE4989E	Đồ án nghiên cứu	8(0-0-16-16)								8