



ASIIN Seal & Euro-Inf-Label

Accreditation Report

Bachelor's Degree Programme / Master's Degree Programme

Information Technology

Provided by

Vinh Long University of Technology Education, Vietnam

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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
Đại học Công nghệ thông tin	Engineer's Degree in Information Technology	ASIIN	/	04
Thạc sĩ Công nghệ thông tin	Master's Degree in Information Technology	ASIIN	/	04
Date of the contract: 20. December 2021 Submission of the final version of the self-assessment report: 15. April 2023 Date of the online audit: 05 – 07 September 2023				
Peer panel: Prof. Dr. Georg Schneider, Trier University of Applied Sciences Prof. Dr. Sandro Leuchter, Mannheim University of Applied Sciences Dr. Uwe Seztak, marco Systems Analysis and Development Tong Vo Anh Thuan, student at University of Information Technology HCMC				
Representative of the ASIIN headquarter: Christin Habermann				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 04 – Informatics/Computer Science as of March 29, 2018				

¹ ASIIN Seal for degree programmes; Euro-Inf®: Label European Label for Informatics;

² TC: Technical Committee for the following subject areas: TC 04 - Informatics/Computer Science;

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	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
Information Technology	Đại học Engineer's Degree	Computer Network and Communication; Computer Science; Internet of Things; Information Security	6	Full time	Tongmyong University	8 Semester	161 Vietnamese Credits (274 ECTS)	Annually 2014
Information Technology	Thạc sĩ M.Sc.	/	7	Full time	/	4 Semester	64 Vietnamese Credits (102 ECTS)	Annually 2018

For the Bachelor's degree programme Information Technology the institution has presented the following profile in the curriculum handbook:

“General objectives:

Learners will be expected to become all-round IT engineers with

- Political qualities, professional ethics to meet the requirements of security, national defense and socio-economic activities
- General knowledge of natural and social sciences and foundational knowledge of information technology;
- Fundamental knowledge in computer networks and communications, computer science, IoT and information security;
- Advanced knowledge and skills in computer network and communications, computer science, IoT and information security;
- Necessary social skills, self-study ability, self-learning ability for success in life and career.”

³ EQF = The European Qualifications Framework for lifelong learning

For the Master's degree programme Information Technology the institution has presented the following profile in the curriculum handbook:

“In order to meet the social demand for human resources with expertise in Information Technology (IT), this curriculum is build to educate master's degree in IT with the following objectives. First of all, providing advance knowledge in IT helps learners widen their professional knowledge. The second objective is the improvement of interdisciplinary knowledge between the IT and other fields. Moreover, it brings opportunity for learners to have in-depth study in one of the specialized IT fields. In addition, it provides master students with capability to work independently, think creatively and flexibly solve problems in the IT industry.

Graduated master students are expected to work at job positions:

- Working at enterprises (CTO, CIO, CEO, Senior Engineer,...);
- Working in domestic and foreign consulting companies on proposing solutions, building and maintaining information systems, systems of computer network and-communication;
- Being capable of planning, projecting, organizing, operating and managing information technology projects in agencies and enterprises;
- Being able to well undertake research in IT research and development departments;
- Having the ability to become programmers, IT system administrators in enterprises;
- Being able to become researchers, teachers in information technology at Institutes, Research Centers and Training Facilities;
- Having the ability to develop study at the Ph.D degree.”

C Peer Report for the ASIIN Seal⁴

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
- Curricula of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

The auditors refer to the respective ASIIN Subject-Specific Criteria (SSC) of the Technical Committee 4 (Informatics), the objective-module matrices for each degree programme, the matching learning objectives and the modules as basis for judging whether the intended learning outcomes of the Bachelor's degree programme Information Technology as well as the Master's degree programme Information Technology correspond with the competences as outlined by the SSC. The description of the qualification objectives, especially in the document titled "curriculum" are comprehensive and include the achieved competencies and possible career opportunities of the graduates.

For the Bachelor's degree, the Vinh Long University of Technology Education (VLUTE) has described general objectives, particular objectives (PO) and programme learning outcomes (PLOs). While the general objectives are developed based on the vision and mission of the university as well as the respective faculty and are rather general and concise, the POs focus in more detail on the skills the students develop during their studies, both in the field of Information Technology as well as overall academic and personal skills, e.g. developing awareness about industrial safety and hygiene, being responsible to society and community and developing scientific and academic abilities.

⁴ This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

In addition, the expected learning outcomes, also called programme learning outcomes (PLOs) describe in great detail the competences the students should acquire during their studies. They are subsumed under the categories “knowledge”, “skills” and “self-control and self-responsibility attitude”. The PLOs can be found in the annex of this report.

The Bachelor’s degree can be studied in one of four different specializations: computer network and communication; cloud computing; Internet of Things (IoT); information security. For all four specializations, VLUTE presents an objectives-module matrix that links all modules, including contemporary and elective ones, to the above mentioned PLOs. This allows not only to gather a quick overview of the courses offered in each specialization but also to assess whether the necessary learning objectives are reached or not.

For the Master’s degree, VLUTE has described programme learning outcomes (PLOs) that are further subdivided into the categories “knowledge”, “skills” and “attitudes”. As it is the case with the Bachelor’s degree, an objectives-module matrix matches the courses to the individual PLOs and vice-versa. The programme learning outcomes define that students should, for example, master expertise extending from the knowledge acquired at university to access new technologies, demonstrate ability to do research and grasp new technologies, be able to detect, discuss and propose valuable ideas and solutions for specific problems in Information Technology, be capable of consulting, designing, implementing, conducting and managing information systems and software products at agencies and business as well as become a responsible and honest IT master with a professional working style and logical thinking, obey the law and have professional ethics while working. The complete PLOs can be found in the annex of this report.

The curricula of both degree programmes further list possible employment opportunities the graduates should be qualified for. Graduates of the Bachelor’s degree may work in IT departments at businesses or agencies, are qualified to work as specialists in research institutes in various IT fields, may participate in the development of enterprise network systems, develop embedded software and automatic systems, may work as specialists analysing and assessing risks and suggesting security solutions for information systems of businesses and agencies and may work as teachers or lecturers.

Graduates of the Master’s programme may work as CEOs or Senior Engineers in domestic and foreign consulting companies on proposing solutions, building and maintaining information systems and systems of computer network and communication. They are further qualified to plan, project, organize and manage information technology projects in agencies and enterprises, and become researchers and teachers at institutes and research facilities alike.

During the discussion with the recent graduates from both programmes as well as the stakeholders, the auditors learn that most students find a job directly after their Bachelor's degree as the demand in Vietnam is quite high for information technologists. Those that continue pursuing their Master's degree most often do so in order to promote their research career, continue on with a PhD or work in a research centre or university. The auditors can further ascertain that the students are prepared sufficiently for a career in the national market as nearly all graduates find work within the first few months after their graduation. The auditors notice however that the PLOs for the Master's programme also state that graduates shall be able to work in "foreign consulting companies". Given the limited English language skills they have encountered during the audit, the auditors are uncertain as to how graduates will be able to work internationally or even in an international team as this requires first and foremost a working knowledge of the English language (s. also criterion 1.3.)

For both degree programmes the auditors are satisfied with the programme learning outcomes as outlined in the official curriculum documents. They conclude that, in formulating the intended learning outcomes, the university has followed the Euro-Inf Framework and the Subject-Specific Criteria of the ASIIN Technical Committee 04 for Informatics. The auditors confirm that the study aims and learning outcomes of the two programmes correspond with level 6 and 7 of the European Qualifications Framework (EQF) respectively. They are further satisfied that the learning objectives are regularly reviewed by VLUTE, its students as well as external stakeholders and adapted to the needs of the industry.

Criterion 1.2 Name of the degree programmes
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Evidence:

- Self-Assessment Report
- Samples of Transcript of Records for each programme
- Study regulations for both programmes
- Curricula for both programmes

Preliminary assessment and analysis of the auditors:

The name of the Bachelor's Degree Programme in Information Technology is regulated in the listed level-IV category of higher education issued with Circular No. 24/2017/TT-BGDĐT dated October 10, 2017 of MOET (Ministry of Education and Training). Similarly, the name of the Master's degree programme in Information Technology is specified in the listed level-IV category of the education and training at Master and PhD's degree issued with Circular No. 25/2017/TT-BGDĐT dated October 10, 2017 of the MOET.

The auditors confirm that the English translation and the original Vietnamese names of both degree programmes under review correspond with the intended aims and learning outcomes as well as the main course language (Vietnamese).

The auditors further confirm that the title “Engineer’s Degree” is used in Vietnam for Bachelor’s degrees in the field of engineering and technology.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Academic Regulations
- Study Regulations for both programmes
- Curricula for both degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

The auditors base their assessment of the curricula of both study programmes on the newest curricula provided to them. For the Bachelor’s degree the newest curriculum is from 2020, for the Master’s degree from 2019. VLUTE has also handed in the previous versions of the curricula, from which the auditors gathered that the curricula are changed every 2-3 years. While this is generally a very laudable process and showcases that VLUTE tries to keep their curricula up to date, the auditors asked if a new version of the curricula will be provided any time soon. They were informed that for both study programmes, 2023 curricula exist. It remains unclear whether these curricula are already in use or will begin this upcoming fall semester. It also remains unclear what changes were made in the new curricula or whether any changes were made at all since the discussion regarding this topic during the audit remained rather nebulous. For example, the auditors asked for the contents of certain modules and received the answer that this module does not exist. Similarly, whenever the auditors asked why certain content was missing in the curricula, they were informed that this content is included in the new curricula. The auditors thus demand that VLUTE provides them the 2023 curricula as well as updated versions of the module descriptions in order to examine what changes have been undertaken and whether the set learning outcomes are still met.

On 05. November 2023, several weeks after the audit, VLUTE has provided the auditors with the current 2023 curricula. The auditors have met with one another to discuss this

curricula, which has not been present during the actual audit. The following assessment in this report will thus focus on the 2023 curricula for both study programmes.

The Bachelor's degree programme is designed for four years (8 semesters) and 161 Vietnamese Credits (VC) need to be achieved, which amounts to 274 ECTS. Of those 161 VC, 133 are compulsory modules, further divided into 44 VC general knowledge and 89 VC professional knowledge, while the remaining 28 VC are elective modules, also divided into general knowledge (5 VC) and professional knowledge (23 VC). The general knowledge courses encompass courses in political theory that are mandatory by Vietnamese law, courses in social sciences and humanities, foreign language and informatics, mathematics, and physical education. The professional knowledge courses are those specially provided for the discipline of Information Technology and encompass modules such as "Basic programming", "Open source software", "information systems analysis and design" or "IoT application development", to name a few.

In addition, beginning in the fifth semester, students choose one of four specializations: computer network and communication, cloud computing, Internet of Things (IoT), and Information Security. Each of these specializations encompasses 7 modules and a total of 19 VN (32 ECTS). In addition to these specializations, VLUTE also offers certain elective modules, mostly in the form of "choosing 1 of 2 courses" to the students to further individualize their course of studies. The auditors further learn that there exist so-called "graduation condition courses" (24 VC) that students must pass in order to graduate but that are not part of the curriculum. Instead, these courses are offered every semester so students can choose when they want to partake in them. These include courses that are obligatory by Ministerial regulations and include "English", "National Defense and Security Policy of the Communist Party of Vietnam", "General Military" and "Techniques and Tactics for Infantry Fighting."

The final semester is dedicated to the graduation internship and the graduation project *or* three modules that can be substitutes for the graduation project. While both, graduation project and the substitute courses are worth 10 VC (17 ECTS), the auditors remark that a graduation project or final thesis is obligatory for graduating with a Bachelor's degree and thus cannot be substitute by taking further courses.

When studying the content of the curriculum, the auditors are generally satisfied. They understand that universities are directed under Vietnamese law to include courses outside of the field of Information Technology, such as "Marxist-Leninist philosophy", "National Defence and Security Work" or "Ho Chi Minh's Ideology"; yet they register that, due to the programme amounting to 274 ECTS, enough credits are given to subject-specific content.

The Master's degree encompasses 64 VC (102 ECTS) and is designed for three semesters. The faculty describes that "the curriculum ensures factors of foundation, modern and advanced technologies. The foundation factor is shown in consolidating, expanding and improving the knowledge provided [while] modern factors and advanced technology are reflected in the inclusion of topical specialized courses integrating the technologies such as Big Data Processing, Semantic Web, Data Mining and Computer Network. Applying advanced technologies is also demonstrated through [elective courses] on outstanding technologies (Information Safety and Security, 3D Modelling, Modelling and Building Service-Oriented Systems) in accordance with the needs and situation of IT development." In order to achieve this, the curriculum encompasses 44 VC compulsory modules and 20 VC elective modules. The graduation thesis is mandatory and amounts to 14 VC (21 ECTS).

During the audit, the auditors tried to have a discussion with the students about their satisfaction with the curricula of both programmes. The students were very reserved so an open conversation, as the auditors have experienced in other audits, was not given. In addition, as only very few students were able to converse in English, a translator was needed, and only a handful of students even participated in the discussion, while most remained silent or discussed among themselves in Vietnamese, before giving an answer to the translator, as all students were located within the same room. These circumstances led to the unfortunate issue that the auditors left the discussion round with the students with very few indications as to whether the students were satisfied or not. The auditors only received the notion that students wished for more access to current programming language and for more practical work to prepare them better for future employment. The auditors were unfortunately not able to get any detailed information from the students regarding these two matters, while both the teachers and the industry representatives did not see any problems in these areas. On the contrary, VLUTE states that the list of programming languages include C++, C#, Python, HTML, PHP, Java, Javascript, Matlab, SQL, Assembly, Scala, Kotlin, ASP, XML, Visual Basic, Oracle Database Management System.

The auditors find this to be a rather broad scope of programming languages and question, whether students can select the languages they wish to learn or have to learn all the languages, in which case their understanding of them would be rather shallow. In addition, the experts are still unsure whether, and to which degree, these languages are actually taught since the students complained during the audit about not learning the necessary programme languages.

The auditors also ask VLUTE to increase the practical experiences students gain during their studies, e.g. through more work undertaken jointly with partners from the industry. They definitely believe, however, that the English language competencies of the students must be strengthened in order for them to be able to work in an international surrounding or

with international colleagues. Especially for the Master's graduates, a good proficiency of the English language is a must, if they prepare to further their career in academia. The auditors note that mandatory English courses are already part of the curriculum, yet the level of fluency that should be reached by the students is deemed too low. According to the self-assessment report, the recommended English level for Master's students is at least B1 or an equivalent according to the Common European Framework of Reference for Languages. While VLUTE believes this level to be adequate for the students to integrate well into the international working environments, the expert disagree with this assessment. During the discussion with the programme coordinators, they learn that the English level should be raised to B2 in the new curriculum. When looking at the 2023 curriculum, the module "English 4" should enable students to learn "listening skills to grasp details and main ideas, apply reading comprehension methods (scanning and skimming), write emails and paragraphs, present personal information and topics related to the lesson units." This, according to the auditors, is not up to a B2 level and does not allow the students to partake in an international English-speaking environment.

After reviewing the new 2023 curricula, the auditors come to the conclusion that on paper, both study programmes seem up to date and that they should prepare the students well for the labour-market. However, as described under criterion 5.1, many of the module descriptions are still missing, so the auditors could not attain a comprehensive picture of the contents taught and the learning outcomes to be achieved. This also makes it difficult for them to assess whether the respective EQF levels are reached. The latter is further complicated as, despite having asked for it repeatedly, only a very small sample of exams (three for each programme) has been handed in and for the Bachelor programme, only covered the first two semesters in which generally only very basic topics are discussed. In addition, no additional final thesis were handed in so the auditors had solely the three samples to judge that were already presented during the audit. In their opinion they seem to be alright for the Bachelor's level (EQF 6) but only barely touch the Master's level (EQF 7). As the auditors neither had the chance to discuss the 2023 curricula with those responsible for the programme nor got a sound selection of exams and final theses, they cannot yet conclude whether the programmes reach the intended EQF level.

The experts also note that the documents submitted by the university following the audit were significantly more informative than the discussions during the audit. Due to the lack of English language skills, direct dialogue between reviewers and university managers as well as students and teaching staff was hardly possible. The experts can therefore only make their assessment of the curricula of the two programmes on the basis of the documents submitted, but cannot verify this through discussions with the individual stakeholders. For this purpose, a follow-up visit must be carried out on site.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- Admission Regulations
- Curricula for both degree programmes
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

According to the Self-Assessment Report, admission for both degree programmes under review is conducted once a year in September. Information about the admission procedure can be found in the Undergraduate Admission Scheme for the Bachelor's degree and the curriculum book for the Master's degree. VLUTE establishes the Admission Council to carry out the annual processes of administration. The council includes the Board of Rectors, leaders of the affiliated departments, faculties and centres. Based on the acceptance of the Admission Council, the Rector signs and promulgates the admission scheme, which is then published on the websites of both the Ministry of Education and Training (MOET) and VLUTE and included in promotional materials and brochures. The scheme of admission also specifies that admission counselling activities must take place. As such, the admission advisory board conducts seminars and consults teachers and prospective students with the content focusing on enrolment methods, combination of courses, the application procedure as well as the examination process.

The Undergraduate Admission Scheme is newly established every year and the current version available to the auditors is that of 2021. Accordingly, there are four methods by which students can be admitted to the Engineer's degree (Bachelor's degree) at VLUTE:

1. Admission based on the results of the national high school graduation exam (annual national university entrance exam)
2. Admission based on the results of the high school transcripts
3. Direct recruitment, admission priority
 - a. Direct recruitment, admission priority according to MOET regulation
 - b. Direct recruitment, admission priority according to VLUTE regulation
4. Admission based on the results of a competency assessment test of Vietnam National University

For all four methods, the Undergraduate Admission Scheme lists the necessary steps and due dates. For each academic year, the university determines the ratio of students admitted through these different ways. VLUTE has provided an overview of the enrollment

quota, the number of applicants as well as the number of enrolled students. It becomes clear that the number of applicants is higher than the enrollment quota and that, with the exceptions of the years 2016 and 2020, the number of enrolled students exceeds the enrollment quota, especially in the years 2021 – 2023 where the quota is exceeded by around 100 students. (Whether there are enough staff members to support this increasing number of students will be discussed under criterion 4.1)

YEAR	ENROLLMENT QUOTA	NUMBER OF APPLICANTS	NUMBER OF ENROLLED STUDENTS
2016	150	204	136
2017	150	418	241
2018	200	584	250
2019	250	570	248
2020	250	594	170
2021	210	314	301
2022	210	350	337
2023	220	333	328

For the Master's degree, the admission requirements are listed in the curriculum book. Applicants must possess a bachelor's or engineer's degree in Information Technology, Computer Science, Communication and Computer Network, Software Engineering and Information System. Candidates with a bachelor's or engineer's degree in a related field with the maximum difference of the curriculum being 40%, must take additional courses before being able to study the Master's programme. These courses, that amount to 20 VC (37 ECTS), include Discrete Mathematics, Database Systems, Data Structure and Algorithms, Information System analysis and Design, Image Processing, Artificial Intelligence as well as Object-oriented Programming. Making up these courses should ensure that all master's students have the same level of knowledge. After the candidates who fully meet the above requirements have been selected, VLUTE organizes an entrance exam upon which results the new students will be selected.

VLUTE has provided an overview of the enrollment quota, the number of applicants as well as the number of enrolled students.

YEAR	ENROLLMENT QUOTA	NUMBER OF APPLICANTS	NUMBER OF ENROLLED STUDENTS
2020	20	19	19
2021	20	8	8
2022	30	24	24
2023	20	9	9

These numbers are much lower than those for the Bachelor's degrees and can be explained by the fact that most students find work directly after their Bachelor's degree and thus see no need for a second degree. The fact that all applicants are enrolled into the programme shows that the applicants know exactly what they are getting into and have the necessary qualifications for a Master's degree. This is also demonstrated by the fact that there are no drop-outs among the Master's students (see also criterion 2.2).

The auditors find the admission process and criteria for both programmes to be transparent and binding. They confirm that the admission requirements are eligible to support the students in achieving the intended learning outcomes of each programme. Given the overall high number of Bachelor students and the fact that in the last three years a surplus of 100 students was admitted, the auditors would have liked to have the chance to discuss these matters with the students, and make sure, that the exceeding number does not limit the programmes' studyability. In addition, they wish VLUTE to give a reason as to why there is a consistent surplus of Bachelor admittance. This should be another point of discussion during an additional on-site visit.

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

The experts regard criterion 1 as **not fulfilled**.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report

- Curricula for both degree programmes
- Module descriptions
- Academic guidelines
- Statistical data about cohort history
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

The curricula of both study programmes are periodically reviewed and adjusted every two years; accordingly, the syllabi are updated and modified based on the comments of stakeholders, which are collected through online and offline surveys and questionnaires.

The Bachelor’s degree programme is designed for four years (8 semesters) and 161 Vietnamese Credits (VC) need to be achieved, which, according to the conversion factor of 1:1.7, amounts to around 274 ECTS. Of those 161 VC, 133VC are compulsory modules, further divided into 44 VC general knowledge and 89 VC professional knowledge, while the remaining 28 VC are elective modules, also divided into general knowledge (5 VC) and professional knowledge (23 VC).

Knowledge blocks	Credits			Total
	Compulsory		Elective	
	Theory	Practice		
National Defense and physical education (*)	5	6	0	11
Foreign languages and informatics (*)	12	1	0	13
General knowledge	20	0	5	25
Professional knowledge	46	30	24	100
<i>Fundamental knowledge</i>	<i>24</i>	<i>12</i>	<i>2</i>	<i>38</i>
<i>Knowledge of the discipline</i>	<i>22</i>	<i>17</i>	<i>3</i>	<i>42</i>
<i>Specialized knowledge</i>	<i>0</i>	<i>0</i>	<i>19</i>	<i>19</i>
Graduation	0	2	10	12
Total	83	39	39	161

The Master’s degree encompasses 64 VC (102 ECTS) and is designed for three semesters. The curriculum encompasses 44 VC compulsory modules and 20 VC elective modules. The graduation thesis is mandatory and amounts to 14 VC (23 ECTS).

Knowledge blocks	Compulsory	Elective	Credits
General knowledge	15	0	15
Fundamental knowledge	6	5	11
Specialized knowledge	9	15	24
Graduation Thesis	14	0	14
Total	44	20	64

As has been documented under criterion 1.3, the auditors find the structure and content of the curricula to be satisfying in general and deem them to match the learning outcomes. Yet, as the curricula were handed in *after* the audit had already taken place, the auditors had not chance to discuss them with the programme coordinators or the students and thus cannot verify the extent to which the teaching content is actually implemented.

International Mobility

Given the documentation provided by VLUTE, international mobility seems to be rather low. The Self-Assessment Report does not mention international exchange (incomings or outgoing students) and given the limited English language proficiency of most students, studies abroad do not seem too popular. The auditors thus ask VLUTE to hand in an overview of the incoming and outgoing students in both degree programmes under review. Nonetheless, the auditors recognize that VLUTE holds cooperation agreements with five foreign universities, namely Tongmyong University, Koreatech University and Chosun University in South Korea, Seneca College in Canada and Aix Marseille University in France. Article 23 of the Regulation of Training in University and College under the Credit-Based System states that student exchange is generally allowed and supported but that the recognition of the number of credits that students accumulate at foreign universities must not exceed 25% of their total volume of credits. The Regulation on Master-Level Training further specifies that the number of recognized credits from a foreign university must not exceed 30 VC. In order to recognize courses, certain requirements must be fulfilled:

- a) the requirements for output standards, lecturers, learning volume and other requirements of the courses in the Master's training are met
- b) the valuation score must be C or higher
- c) the course must not have been completed more than half a year prior to the time of recognition and conversion.

The auditors note from the documents that it is generally possible for students to spend a semester at another university and receive credits for the work done there. However, the regulations presented are not particularly specific and - with regard to the credits to be

credited - also quite restrictive. There are no regulations that specify the exact process of credit transfer or offer students any assistance in this regard. The low number of university cooperations as well as the low level of English skills of the students also prevent mobility abroad. The auditors therefore agree that a university such as VLUTE, which is seeking international accreditation, needs to work more on its internationalization strategy. In this regard, more detailed regulations must be established for the creditability of externally performed services, which, among other things, introduce the reversal of the burden of proof. Likewise, students should be informed more about possible opportunities for a stay abroad and cooperation with foreign universities should be expanded.

Criterion 2.2 Work load and credits

Evidence:

- Self-Assessment Report
- Curricula for both degree programmes
- Module descriptions
- Academic regulations
- Drop-out rates for the Bachelor's programme
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

In the Bachelor's programme, most courses consist of 1-4 VC with the exception of the graduation project (10 VC). Per semester, students take between 12 – 21 VC. The first two semesters include 10 courses, the third one 11, semesters 4-7 hold 7 courses while the final semester holds the graduation internship as well as the graduation project or three substitute courses (cf. criterion 1.3). Another 24 VC in the form of the so-called graduation condition courses (cf. criterion 1.3) can be assigned by the students themselves to the individual semesters according to their time allotment. For this purpose, students mostly choose the semesters with the lowest amount of mandatory credits. In the Master's programme, most courses have 3 VC; a few also have 2, and the thesis 14. The first two semesters hold 20 VC, the third one 24 VC. Seven courses must be taken in the first two semesters, and only the thesis in the last semester, in addition to three English courses.

The auditors confirm that the workload is spread relatively evenly over the semesters. The workload in the final semester of both study programme is markedly reduced to give the students enough time for their final theses as well as to already start looking for a job or further study programme.

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 it is equivalent to 60 periods, whereas in the project work and the thesis, it is worth 45 periods. One period lasts for 50 minutes. The workload calculation is depicted in the table below, where – as is quite visible – study time is either calculated in “period” (50 minutes each) or minutes, which further complicates the conversion. To sum this up, the formula for converting credits at VLUTE to ECTS, according to the conversion regulation by the Ministry of Labor, War Invalids and Social Affairs is as follows:

“As each ECTS credit is calculated between 25 and 30 hours of study/practice/internship (including self-study hours) depending on different countries in Europe and depending on the individual regulations of each institution, the university unanimously chooses an average of 27.5 hours per ECTS credit as the basis for the equivalent conversion at the University.”

Thus, 1 VC for theoretical work (Theoretical Credit) is equivalent to 1.5 ECTS, while 1 VC for practical work (Practical Credit) is equivalent to 2 ECTS.

Course Types	Credits	Lecturer's teaching time (live)	Student's study time (live)	Student's preparation time
Theoretical courses teaching in class	1	15 periods	15 periods	30 hours
Physical education	1	30 periods	30 periods	
Course projects	1	Students contact lecturers when necessary	45 hours	
Practical and experimental courses	1	36 hours (QD 26) 30 hours (other versions)	36 hours (QD 26) 30 hours (other versions)	30 hours
Production Internship	1	Students contact lecturers when necessary	90 hours	
Essay, major assignment, or project, graduation thesis	1	Students contact lecturers when necessary	60 hours	

The auditors further discuss the success-rate of the enrolled student. They find that all students that begin the Master's programme also finish it; thus so far not drop-out rates have been documented. In the view of the experts, this is probably due to the fact that only a very small number of students start this Master's programme and these students have the appropriate qualifications and motivation to successfully complete it.

For the Bachelor's degree, however, key figures from the university show that in each cohort up to 45% of students do not complete their studies. During the audit, the auditors inquire with programme managers, students, alumni and faculty about the reasons for this high drop-out rate, but receive no relevant answers. It is reported, for example, that students would study longer for family reasons or enter professional life prematurely and without a degree. However, these reasons do not seem particularly plausible to the auditors, nor do they explain why almost half of the students in some cohorts drop out. To rule out the possibility that this has structural causes, the university must systematically analyze the reasons for the high drop-out rates and introduce countermeasures.

The auditors also notice that of those students finishing the Bachelor's degree, around 60-70% finish their studies on time, which generally leads to the conclusion that the programme is manageable. Results of student surveys that were presented by VLUTE as well as discussions with the students, albeit given how difficult they were in general, show that the workload is not deemed too high.

VLUTE subsequently issued a statement on this topic and explained that the following steps have been implemented over the years to counter students' dropping out of the programme:

- During the teaching process, when lecturers discover that students are absent from class frequently, they will usually notify the academic advisor to discuss with the Department of Student Affairs to contact the student's family to find out the reason for the student's absence.
- When students' learning results do not meet the requirements, the academic advisor notifies students to adjust their learning methods more actively. From there, students will make a study plan to improve their learning results.
- For students with weak learning results, the school also stipulates the maximum number of credits from 10-14 credits to ensure compatibility with the student's level
- Besides, during the learning process, if students have difficulty in learning, they can discuss directly with the lecturer or contact via Email or Zalo.
- During the process of organizing classes, lecturers also create conditions for students to form groups to support each other in meeting course requirements

The auditors note positively that VLUTE has support mechanisms for its students and that, for example, the repeated absence of students or poor performance is tracked.

In addition, VLUTE names the following as reasons for the drop-out of students:

- at the high school level, career orientation for students is still emotional and many students want to study with friends, so they choose the major of their classmates, not the major that they personally like. Besides, many students also register for majors according to parents' wishes.
- Students spend a lot of time working part-time to earn living, which affects their studies.
- Students, during the internship, are retained by the business and after that they have no intention of continuing their studies. Some students study the school's part-time system.

- The Mekong Delta region's economic conditions are still difficult.

However, what the reviewers lack is systematic tracking of the very high drop-out rate, for example through discussions with students or other types of analyses. This is the only way to determine what the actual reason for the high drop-out rates is, as the reviewers are still not entirely convinced that this is solely due to poor student performance, as in this case the university's efforts should have already had an effect.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Curricula for both degree programme
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

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. Lecturers generally prepare presentations to support 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. In addition, practical activities should enable students to be acquainted with practical activities for research. As has already been described under criterion 1.3, during the discussion with the students it was mentioned that they wish for more practical training, be it in the form of longer internships, more contact to industry auditors or more hands-on research in the computer laboratories on campus. The auditors support this request.

In summary, the expert 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 both programmes under review 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 Report
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

VLUTE offers a comprehensive advisory and support system for all undergraduate and graduate students. All annual plans of the Faculty of Information Technology and its affiliated units are aimed at supporting the students, thus ensuring the quality of their education. According to the training regulations, the Faculty of Information Technology collaborates with the Department of Academic Affairs to assign lecturers who act as academic advisors. Each academic advisor manages and monitors the training progress of the cohort they have been assigned to. This is necessary, in order to regularly evaluate the student's learning results and to give them immediate learning advice or warn them, if necessary. According to the VLUTE's training regulations on warning academic results and forced expulsion, the notice of learning results is carried out each semester to help students with poor academic results know and make plans to study appropriately to graduate within the maximum time allowed. To implement all this, the Rector assigns the departments to preside over the implementation of training consultancy activities, extracurricular activities, complaint settlement as well as support for students with low results or disadvantaged students.

To support students financially, VLUTE also offers scholarships, either directly through the university or through companies, businesses as well as individuals. VLUTE also holds a Youth Union who directly manages activities among the students.

To promote the students' professional careers, VLUTE has established a start-up incubator where students are introduced to high-quality start-up courses. In addition, ideas and projects of the students are reviewed and selected projects will participate in regional and national start-up competitions. In addition, the Department of Business Relations and Support organizes activities such as career orientation, skills training and job promotion.

The auditors notice the good and trustful relationship between the students and the teaching staff and learn that many times, students are able to talk directly to the teachers when faced with problems. There are enough resources available to provide individual assistance, advice and support for all students, although the auditors did not receive any information regarding the support for disabled students (cf. criterion 3).

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

The experts regard criterion 2 as not fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation
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Evidence:

- Self-Assessment Report
- Module Descriptions
- Examination Regulation
- Samples of Exams, Project Works and Theses
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

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, VLUTE utilises various types of examination.

According to the Regulation on University and College Education Using the Academic Credit System, the learning outcomes in the Bachelor's degree programme are evaluated according to the following parts: process evaluation, mid-semester test, and final examination, with a ratio of 10%, 40% and 50% towards the final grade respectively. To measure the student's capability to achieve the learning outcomes, various examination methods are used, such as online quiz, writing test, homework, practice test, course work or essay. The module descriptions as well as the course syllabus specify the method of examination and the component grades. The teaching staff is responsible for announcing the evaluation methods at the beginning of the semester. The process grade and the mid-semester grade are assigned by the teaching staff as well as the criteria chosen for these grades while the conditions for taking the final exams are set forth in the education regulation.

Undergraduate students at VLUTE have the option to do a graduation project (final thesis) or take substitute courses in the curriculum to complete their learning progress. The graduation project cannot be freely chosen by students but instead only students with a cumulative GPA of 2.4 or higher and who have not been disciplined are allowed to partake in the

graduation project. Yet, as a final thesis or graduation project must be a compulsory part of the Bachelor's degree, it cannot be an option for a selected elite. The auditors also learn that the Department of Academic Affairs is, at least partially, responsible for deciding upon the thesis topics and assigning the thesis instructor, which – at least for the most part – should be up to the students themselves. VLUTE clarifies that the Department of Academic Affairs prepares the study plan for students to write their graduation theses and that based on this study plan, students prepare an outline and contact their instructor to discuss the topic and its implementation. The instructor will then discuss the topic with the student and the scientific council will approve this. Thus, it seems that within a certain framework, the students are indeed free to choose the topic for their final thesis.

For the Master's degree the final grade of each course is also made up of 10% process assessment, 40% mid-term exam and 50% final exam. As examination form for the final exam, mostly course projects or essays are used, while other methods such as online quizzes, writing tests or practice tests are combined to evaluate the learning processes.

Master's students are required to complete their training process with a graduation thesis. They must pass all courses in the Master's degree programme and score at least 5.5 (on a scale of 10) or at least C (on letter grade) for the cumulative GPA in order to defend their thesis. The students should objectively contact lecturers or professors to present ideas and research orientations for their graduation theses. After receiving the acceptance of instructors, the students will research and present the outline of the chosen orientation. The thesis proposals of the master's students need to be defended and receive the approval of the appraisal board.

For both programmes, although it seems 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 forms and the rules for grading.

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 auditors appreciate that corresponding rules are in place.

The auditors, however, could not find any information regarding compensations for sick, disabled or otherwise disadvantaged students and ask VLUTE to implement respective regulations that support students from all walks of life in finishing their studies successfully. After the audit, VLUTE hands in examples of an implemented social security policies, such as tuition exemption and reduction policies and special exemption for disabled or ill students. All of this seem to be decided well within the students' interests, yet what is still missing are concise regulations that guarantee a right for compensation for e.g. sick and disabled students in general.

Students who underperform 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. While the auditors agree that limiting the number of credits a student who is struggling, has to take, they do not believe it to be very fruitful to force a student to drop-out who has difficulties two semesters in a row. This, however, may explain the high drop-out rate mentioned under criterion 2.2. If so, VLUTE should analyse why nearly half their Bachelor's students actively fails their studies.

The auditors had a small sample of exams and final projects as well as final theses that they reviewed. They came to the conclusion that while some samples matched the respective level of EQF 6 and 7, some did not. In order to further assess this issue, the auditors ask VLUTE to provide them with more samples of exams and final projects.

In summary, the auditors conclude that the overall system of examinations is regulated efficiently and transparently at VLUTE and that the various forms and methods allow for a fruitful review of the learning outcomes. The auditors further agree that the examination system is well thought-out and seems to work smoothly. Yet, VLUTE must implement a mandatory Bachelor's thesis (or final project) as well as compensations for sick or disabled students. The auditors also wish to review more samples of exams and final theses to validate whether the EQF levels 6 and 7 are reached.

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

The auditors regard criterion 3 as not fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Report
- Staff Handbook
- Curricula for both degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

At VLUTE, the staff members have different academic positions. There are full professors, 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. For the Bachelor's and Master's degree in Information Technology, a total of 44 lecturers is responsible, among them 1 associate professor, 8 lecturers who hold a PhD, 30 lecturers who hold a Master's degree and 5 postgraduate students who serve as teaching assistants. Besides the permanent staff, some visiting lecturers also support the teaching work. In total, 49 lecturers are responsible for 1.082 students in the Bachelor's programme in 2023, a ration of 1:22, while for the Master's programme, 14 lecturers are responsible for 43 students, a ratio of 1:3. While indubitably these lecturers also teach in other study programmes, the auditors deem that generally, enough staff exists to carry both study programmes. The auditors further maintain that the nine faculty with a doctorate are sufficient to supervise master's students during their master's thesis, as the numbers of master's students are very manageable.

According to VLUTE's regulation, each lecturer must complete at least 280 teaching hours per year, which seems to include the hours spent on scientific research, professional activities and other activities such as being academic advisor to many students. The workload of the staff members is monitored and based on the results VLUTE then performs annual emulation and commendation work such as ranking emulation or evaluations. In addition, VLUTE presents a comprehensible system that clearly depicts how many hours a lecturer must work to prove that the student-lecturer ratio is durable.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

According to the self-assessment report, VLUTE encourages the continuing professional development of its staff. For this purpose, various opportunities are provided. Faculty members can participate in didactic training that encompasses curriculum design, teaching material, and innovative teaching and learning methods. Moreover, workshops related to subject-specific fields are held to refresh and to deepen various didactic competences in each semester.

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. The problem here, as with the international exchange of students, is the low proficiency of English, which is why the auditors urge VLUTE to not only invest in the English language capabilities of its students, but of its staff members as well. In addition, the auditors point out, that of the 44 persons involved in both study programmes, only 9 hold a PhD. The auditors state that VLUTE must also work on the scientific advancement of its own employees so that they can continuously further their qualifications and meet academic standards.

In summary, the auditors highlight the highly engaged and motivated staff members. They 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
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Evidence:

- Self-Assessment Report
- Presentation of the facilities during the online audit
- Discussions during the audit

Preliminary assessment and analysis of the auditors:

The Faculty of Information Technology is equipped with eight computer labs, one IoT hardware engineering lab and one information network cabling lab. According to the self-assessment report, these laboratories are equipped with the most advanced equipment for learning and scientific research activities. Unfortunately, the presentation that was given

during the online audit was insufficient for the auditors to confirm the high-quality of the equipment nor whether enough equipment is available for all the students.

Similarly, the auditors were also not able to gather any reliable information on the overall equipment of the university, such as the library, the online access to reference books and journals or the places where students can meet for their own or for group work. For example, the self-assessment report states that students have access to nearly 19.000 Vietnamese reference titles online but only to 11 foreign language titles. Yet during the discussion with the lecturers, they claimed that students indeed have access to various international resources, such as Springer-Link, albeit not being able to show this to the auditors upon request. Similarly, the auditors also received no reliable information on the hard- and software as well as the programming language that the students were able to regularly use.

After the audit, VLUTE clarified that before a decision is made to promulgate a curriculum, the conditions for ensuring the quality of the curriculum offered, including books, facilities and personnel, are judged and verified by an independent council. The auditors believe this “check” to be a very valuable tool, yet they still need to make this conclusion themselves. Hence, VLUTE has provided a vast array of documents depicting the infrastructure of the programmes. Unfortunately, besides a list of programming languages and software used, all of these documents are in Vietnamese and thus not legible for the auditors.

In summary, the auditors could not gather reliable information on the equipment of the two degree programmes under review. While it appears that financial funding is available (for example around 100.000€ were invested in a SAN standard storage server and 300.000€ were utilized to build VLUTE’s e-learning system), the auditors cannot judge the equipment and infrastructure on-site. As such, it will be necessary that some members of the expert group visit the campus to assess the situation.

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

The auditors regard criterion 4 as not fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions
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Evidence:

- Module Descriptions

- Discussions during the audit

Preliminary assessment and analysis of the auditors:

The auditors 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.

Yet, as has been remarked several times throughout this report, not all module descriptions were provided.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Sample Diploma for each degree programme
- Sample Transcript of Records for each degree programme

Preliminary assessment and analysis of the auditors:

The auditors confirm that all students of the two degree programmes are awarded a Diploma and a Transcript of Records after graduation. The Transcript of Records lists all courses that the graduate has completed, the achieved credit points, grades, and cumulative GPA. However, a Diploma Supplement is missing and must be awarded to the graduates as well. The Diploma Supplement must further entail all necessary information including statistical data about the distribution of the final grade according to the ECTS Users' Guide to allow the reader to categorise the individual results.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Report
- Academic Guidelines
- Webpage VLUTE
- Webpage Faculty of Computer Science and Engineering

Preliminary assessment and analysis of the auditors:

The auditors confirm that the rights and duties of both VLUTE 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. What is missing, however are,

as already mentioned, binding regulations for the compensation of disadvantages as well as the recognition of externally achieved deliverables.

In addition, the auditors notice that none of the important information such as admission requirements, module descriptions or curricula, can be found on the university's webpage and is thus not available to external persons or prospective students. VLUTE must publish those on the School's webpage.

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

The auditors regard criterion 5 as not fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development Evidence:

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

Preliminary assessment and analysis of the auditors:

Since 2015, VLUTE has built a quality management system according to ISO 9001:2008 and has switched to applying a quality management system according to ISO 9001:2015 since April 2018. According to ISO standards, the system of quality management documents includes guiding processes and forms for performing tasks corresponding to such processes as admission process, training process, exam process, document management process, recruitment process, and human resource training processes, among others.

From 2016 to 2020, VLUTE further organized training courses on educational quality assurance for most staff members, such as the internal assessment of the quality management system according to TCVN 9001:2008 or the training to change the quality management system from ISO 9001:2008 to 9001:2015. During that period, VLUTE developed a plan for quality assurance, self-assessment, and preparation for the university-level external assessment according to MOET standards. In addition, VLUTE developed an internal educational quality assurance system that meets the criteria for assessing the quality of educational institutions.

The Quality Assurance cycle of the degree programme in IT deals with internal planning, implementation, monitoring, evaluation, testing, measurement, and improvement. The Faculty of Information Technology established a quality internal assurance group [6.1.14] with two members. The performance of the quality assurance cycle is carried out continuously every year. The teaching and learning process of both study programmes is reviewed and evaluated regularly every two years to ensure compatibility and conformity with the learning outcomes. Respective lecturers participate in training programmes and are certified as accreditors of Higher Education Quality Accreditation and professional intermediate level.

The Department on Education Testing and Quality Assurance (DETQA) is the unit tasked with collecting opinions from VLUTE officials, lecturers, staff and students. This review process ensures a continuous quality improvement, especially by removing the processes no longer appropriate and by adjusting and supplementing some procedures to suit practical conditions. These review processes include surveys by staff members, by students as well as alumni. To assess the quality of training and compile statistics of graduates, VLUTE annually surveys the employment situation of students who have graduated.

In summary, the auditors believe the quality management system in place to be one of the university's strong points. The well thought-out system, as well as the involvement of a wide range of stakeholders, shows that VLUTE makes a strong effort to continuously review and improve the quality of the university and its individual study programmes. This demonstrates a tremendous commitment on the part of the university, which is also evident in the discussions with programme managers, the rectorate, and faculty.

The auditors further note that although students are often required to complete surveys on various aspects (e.g. workload, general satisfaction), there is no documentation of how this feedback is subsequently to be handled. The students state that they are never informed about the results of their surveys and thus do not know whether conclusions have been drawn from them or whether changes have been implemented. Since closing the feedback loop is an important part of quality management, VLUTE must also include these aspects in its quality system and implement them in the future.

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

The auditors regard criterion as mostly fulfilled.

D Additional Documents

Before preparing their final assessment, the panel ask that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

- D 1. Student statistics (drop-out rate, regular study time) for the Master's programme
- D 2. Number of applicants vs. number of enrolled students for both degree programmes
- D 3. Samples of exams and final theses for both study programmes
- D 4. Student-to-Teacher-Ratio for both programmes
- D 5. The current version of the curricula (2023)

E Comment of the Higher Education Institution (05.11.2023)

The institution provides the following additional documents:

No.	Evidence
[3.1.01]	Proof that students propose graduation thesis courses with instructors.
[3.1.02]	Proof of tuition fee waiver, support policies for people with disabilities, students with difficulties.
[3.1.03]	Proof of students' illnesses or personal reasons for suspension will be reserved
[3.1.04]	Proof of students with weak academic results, the university also stipulates a maximum number of academic credits from 10-14 credits to ensure that it is suitable for the student's level;
[3.1.05]	Proof of exam samples and final essays to determine if EQF levels 6 and 7 will be achieved.
[4.1.01]	The Circular provides for the determination of enrollment quotas
[4.1.02]	Regulations on working regimes for teaching staff of VLUTE
[4.3.01]	Circular 22/2017/TT-BGDĐT on the promulgation of Regulations on conditions, order and procedures for opening the training sector and suspending enrollment, revoking the decision to open the university-level training sector.
[4.3.02]	Circular 22/2017/TT-BGDĐT on the promulgation of Regulations on conditions, order and procedures for opening the training sector and suspending enrollment, revoking the decision to open the training sector for master's and doctoral degrees
[4.3.03]	Circular 07/2015/TT-BGDĐT on the promulgation of regulations on the minimum amount of knowledge, requirements on competencies that learners achieve after graduation for each training level of higher education and the process of developing, appraising and promulgating Engineer, Master and PhD training programmes
[4.3.04]	List of application software for teaching and types of teaching programming languages in the training program

F Summary: Peer recommendations (24.11.2023)

No.	Evidence
[4.3.05]	Computer Lab Procurement Records
[4.3.06]	SAN Storage System Procurement Records
[4.3.07]	Procurement records of server systems for online training
[4.3.08]	Procurement records of server systems, building virtualization systems on cloud computing platforms
[4.3.09]	Procurement records of materials / implement / equipment for teaching practical modules each semester
[4.3.10]	Records of equipment procurement for system upgrade and repair
[4.3.11]	Dossier of appraisal and procurement of equipment to establish an artificial intelligence center
[5.3.01]	Student's Grade Reservation Application
[5.3.02]	Transcripts of students applying for reserved grades
[5.3.03]	Decision to withhold academic results
[6.1.01]	Evidence that students are informed of survey results through the academic advisor meeting channel
[6.1.02]	Evidence of the fact that students of the school are informed of the survey results through the meeting and dialogue channel between the School Board and all students.
[6.1.03]	Evidence of the school's students being notified of survey results through other channels such as Email, Zalo, Facebook

F Summary: Peer recommendations (24.11.2023)

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

Assessment and analysis for the award of the Euro-Inf® Label:

The experts deems that the intended learning outcomes of the degree programmes do not comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	Suspension	/	Euro-Inf®	Suspension
Ma Information Technology	Suspension	/	Euro-Inf®	Suspension

Preconditions

For all degree programmes

- V 1. (ASIIN 4.3) It is necessary to visit VLUTE on-site in order to assess the technical infrastructure and facilities as well as to have additional discussions with students and teaching staff.
- V 2. (ASIIN 1.3, 3, 5.1) In order to assess, whether both programs meet the respective EQF levels, module descriptions for all modules, containing detailed information on the learning outcomes and the modules' contents, as well as a sound sample of exams and final thesis must be provided.

Requirements

For all degree programmes

- A 1. (ASIIN 1.3, 4.3) Students must have the opportunity to learn the programming languages necessary for their future employment.
- A 2. (ASIIN 1.3) More practical work must be included in the curricula.
- A 3. (ASIIN 1.3, 4.2) The English of both the students and the teachers must be improved significantly. To that matter, English language classes should be established for the students to be able to communicate and work in an international environment.

- A 4. (ASIIN 2.1) The recognition of credits earned at other universities in Vietnam and abroad must be regulated in a way that is transparent and comprehensible to students and other stakeholders.
- A 5. (ASIIN 3) Transparent and binding regulations on disability measures and compensations for disabled students must be implemented.
- A 6. (ASIIN 4.2) The university must support faculty members in their continuing academic development so that more lecturers have doctorates and thus meet academic standards.
- 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 (study plans, module descriptions, intended learning outcomes, etc.) available to all stakeholders e.g. by publishing them on the School'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.

For the Bachelor's degree programme

- A 10. (ASIIN 1.3, 3) A mandatory final thesis must be implemented for the Bachelor's degree.
- A 11. (ASIIN 2.2) The reasons for the high dropout rates of students need to be analysed systematically. Measures must then be derived to counteract the high dropout rates.

G Comment of the Technical Committee 04 – Informatics/Computer Science (28.11.2023)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee follows the assessment of the experts without any changes.

Assessment and analysis for the award of the Euro-Inf® Label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do not comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	Suspension	/	Euro-Inf®	Suspension
Ma Information Technology	Suspension	/	Euro-Inf®	Suspension

H Decision of the Accreditation Commission (08.12.2023)

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

The Accreditation Commission discusses the procedures and follows the assessment of the expert team and the Technical Committee in all regards.

Assessment and analysis for the award of the Euro-Inf® Label:

The Accreditation Commission deems that the intended learning outcomes of the degree programmes do not comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	Suspension	/	Euro-Inf®	Suspension
Ma Information Technology	Suspension	/	Euro-Inf®	Suspension

Preconditions

For all degree programmes

- V 1. (ASIIN 4.3) It is necessary to visit VLUTE on-site in order to assess the technical infrastructure and facilities as well as to have additional discussions with students and teaching staff.
- V 2. (ASIIN 1.3, 3, 5.1) In order to assess, whether both programs meet the respective EQF levels, module descriptions for all modules, containing detailed information on the learning outcomes and the modules' contents, as well as a sound sample of exams and final thesis must be provided.

Requirements

For all degree programmes

- A 1. (ASIIN 1.3, 4.3) Students must have the opportunity to learn the programming languages necessary for their future employment.
- A 2. (ASIIN 1.3) More practical work must be included in the curricula.
- A 3. (ASIIN 1.3, 4.2) The English of both the students and the teachers must be improved significantly. To that matter, English language classes should be established for the students to be able to communicate and work in an international environment.
- A 4. (ASIIN 2.1) The recognition of credits earned at other universities in Vietnam and abroad must be regulated in a way that is transparent and comprehensible to students and other stakeholders.
- A 5. (ASIIN 3) Transparent and binding regulations on disability measures and compensations for disabled students must be implemented.
- A 6. (ASIIN 4.2) The university must support faculty members in their continuing academic development so that more lecturers have doctorates and thus meet academic standards.
- 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 (study plans, module descriptions, intended learning outcomes, etc.) available to all stakeholders e.g. by publishing them on the School'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.

For the Bachelor's degree programme

- A 10. (ASIIN 1.3, 3) A mandatory final thesis must be implemented for the Bachelor's degree.
- A 11. (ASIIN 2.2) The reasons for the high dropout rates of students need to be analysed systematically. Measures must then be derived to counteract the high dropout rates.

I Resumption of the procedure for the Bachelor's Programme Information Technology and the Master's Programme Information Technology (14.11.2024)

Assessment of the Experts (25.10.2024)

The on-site visit for the resumption of the accreditation procedure Ba + Ma Information Technology at Vinh Long University of Technology Education took place on 11th October 2024.

Expert group:

Prof. Dr. Georg Schneider	Trier University of Applied Sciences
Prof. Dr. Kha Tu Huynh	International University, Vietnam National University of HCMC
Thuan Tong Vo Anh	Student at University of Information Technology HCMC

Representative of the ASIIN headquarter:

Rainer Arnold

Preconditions

As part of the accreditation procedure for the Ba Information Technology and Ma Information Technology, two preconditions have been defined for the resumption of the procedure:

- V 1. (ASIIN 4.3) It is necessary to visit VLUTE on-site in order to assess the technical infrastructure and facilities as well as to have additional discussions with students and teaching staff.
- V 2. (ASIIN 1.3, 3, 5.1) In order to assess, whether both programs meet the respective EQF levels, module descriptions for all modules, containing detailed information on the learning outcomes and the modules' contents, as well as a sound sample of exams and final thesis must be provided.

These questions were clarified during an on-site visit, during which the experts discussed with the programme coordinators, students, and teachers the different issues that were identified during the online-audit.

Summary:

The experts confirm that both programmes meet the respective EQF levels (EQF 6 for the Bachelor's programme and EQF 7 for the Master's programme). This is verified by the discussions with the programme coordinators, students, and teachers as well as by the updated module descriptions and a sound sample of exams and final theses. The visited facilities are adequate for the required teaching and research purposes. The inspected theses are adequate and are aligned with the scientific demand of the respective programme. To this end, the experts consider both preconditions for resuming the procedure as fulfilled.

In a next step, the experts give their opinion on the possible requirements and some other issues that were discussed during the visit.

Possible Requirements

For all degree programmes

A 1. (ASIIN 1.3, 4.3) Students must have the opportunity to learn the programming languages necessary for their future employment.

During the audit, the experts inquire what programming languages the students learn in both degree programmes. The programme coordinators explain that in the Bachelor's degree programme Information Technology students are taught Python, Java and C++. This is done in several courses, for example Python is taught in the modules "Object Oriented Programming" and "Basic Programming". The acquired knowledge and skills in programming languages are applied in other courses such as "Machine Learning for IOT" and "Network in Internet of Things". Students' knowledge and skills in programming languages are then deepened in the Master's degree programme Information Technology. The students confirm in the discussion with the experts that there are taught Python, Java, and C++ and that they consider the scope of education in programming languages sufficient. The experts agree with assessment and see no need to issue a requirement or a recommendation to this respect.

A 2. (ASIIN 1.3) More practical work must be included in the curricula.

The experts discuss with the programme coordinators about the structure of the programmes and the share of practical work. They learn that in the Bachelor's programme

most of the courses include some practical work. The general structure is depicted in the following table:

area	compulsory credits	elective credits	theory credits	practical credits
general knowledge	39	5	43	1
core fundamental knowledge	36	2	24	14
disciplinary knowledge	59	3	33	29
graduation knowledge	5	10	0	15
sum	139	20	100	59

The experts confirm that the Bachelor's programme Information Technology includes 59 credits for practical work, which, from their point of view, is sufficient.

However, the share of practical work in the Master's programme is much lower. Here most of the practical work is only done in the Master's thesis, the courses usually do not include any practical work at all. The general structure is depicted in the following table:

area	compulsory credits	elective credits	theory credits	practical credits
general knowledge	15	0	15	0
core fundamental knowledge	9	3	11	1
disciplinary knowledge	9	18	26	1
graduation knowledge	16	0	0	16
sum	49	21	52	18

The experts think that the share of practical work in the courses of the Master's degree programme Information Technology should be increased. However, they see from the discussions during the audit that students do not have a severe lack of practical skills. Therefore, they recommended to increase the share of practical work in the Master's programme.

A 3. (ASIIN 1.3, 4.2) The English of both the students and the teachers must be improved significantly. To that matter, English language classes should be established for the students to be able to communicate and work in an international environment.

The experts emphasise that it is very useful for students to spend some time abroad already during the later semesters of their Bachelor's studies or during the Master's programme to

improve their English proficiency. Some teaching material are in English but in general, there is a recognisable need to improve the students' and teachers' English proficiency. This would help teachers to be able to teach more in English and to expand the possibilities to conduct international research collaborations.

However, the experts see that both programmes are taught in Vietnamese and, therefore, they think a recommendation with respect to improving students' and teachers' English proficiency is sufficient.

A 4. (ASIIN 2.1) The recognition of credits earned at other universities in Vietnam and abroad must be regulated in a way that is transparent and comprehensible to students and other stakeholders.

VLUTE has submitted a regulation to this respect, which states in Article 17:

5 b) If the new student is a former student of another institution, they must submit an official transcript from the institution previously attended along with the request form.

The process of receiving requests and reviewing academic result recognition is conducted when students first enroll. The academic committee will meet to review and officially notify students of the results within one month from the date the request is received.

6. The maximum transferable credit load cannot exceed 50% of the minimum academic load of the training program; for teacher education programs, the transfer process follows the guidelines of the Ministry of Education and Training.

The experts consider this regulation to be sufficient to make transparent that credits earned at other universities in Vietnam and abroad are recognised at VLUTE. To this end, the experts see no need to issue a requirement to this respect.

A 5. (ASIIN 3) Transparent and binding regulations on disability measures and compensations for disabled students must be implemented.

The experts point out that having regulations on disability compensation is essential to ensure fairness, inclusivity, and equal opportunities for students with disabilities. This regulation should provide the necessary framework to guarantee that students with disabilities have access to education without facing unnecessary barriers or discrimination. During the audit, the experts learn that if there is a student with disabilities, the situation is discussed with the academic advisor to find individual solutions for the student. However, no official regulation or guideline to this respect exists. As a result, VLUTE needs to design a guideline on how to support students with disabilities so that they can achieve the intended learning outcomes. Such a guideline should, for example, include compensation measures for exams and offer alternative forms of exams. Without a regulation, students with disabilities may

be unfairly disadvantaged by the physical, technological, or academic structures that are not designed with their needs in mind.

A 6. (ASIIN 4.2) The university must support faculty members in their continuing academic development so that more lecturers have doctorates and thus meet academic standards.

VLUTE encourages training of its academic staff for improving their didactic abilities and teaching methods. The Office of Human Resources Management is responsible for identifying training needs of staff members, developing training plans, and carrying out training activities.

Faculty members can also further develop their competencies through several activities such as post-doctoral programmes, trainings, workshops, and joint research. Moreover, teachers are encouraged to present their research papers in national and international conferences, and to collaborate with colleagues from international universities.

Newly recruited lecturers are encouraged to take some teaching training courses. Faculty members are also trained from time to time to make sure they stay updated with the latest technologies and methodologies when it comes to teaching.

The experts discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at VLUTE, their opportunities to further improving their didactic abilities, and to spending some time abroad to attend conferences, workshops or seminars.

The experts confirm that VLUTE offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

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.

The experts point out that the students of both programmes need to be awarded a Diploma Supplement after graduation. The Diploma Supplement needs to contain all necessary information about the degree programme including acquired soft skills and awards (extra-curricular and co-curricular activities) and should follow the European template. The Diploma Supplement should also include statistical data about the distribution of final grade. This allows the reader to categorise the individual result.

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.

The experts see that VLUTE provides links for the English homepages of the two programmes. These homepage include the essential information about the programmes (PO, ILO, study plan, module descriptions) However, one cannot find these homepages via VLUTE's homepage. The programme coordinators confirm this observation and will contact the university's IT-division to redeem this situation. The experts are satisfied with this solution and see no need for further action.

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.

The experts discuss with the programme coordinators how the course questionnaires are conducted and what happens if there is negative feedback from students. They learn that at the end of each semester, the Office of Quality Assurance and Testing conducts students' surveys to collect their feedback about the courses taken. Students can provide feedback using the university's online system. The feedback is analysed by the Office of Quality Assurance and Testing and sent to the Dean of the Faculty of Information Technology and the individual lecturers. The Faculty of Information Technology will then review each course to ensure teaching and learning activities were carried out efficiently. If there is any negative feedback, the Dean will arrange a meeting with the lecturers in charge and request improvement for the next semester. In addition to the satisfaction surveys, the Dean meets with students at the end of each academic year to gather feedback. At these meetings, students have the opportunity to share their thoughts and suggestions, and they receive responses to their feedback. Students are also informed of plans and possible actions for improving study programmes and services. Part of the discussion is the students' feedback in the satisfaction questionnaires.

The experts are satisfied with this explanation and see no need for further measures.

For the Bachelor's degree programme

A 10. (ASIIN 1.3, 3) A mandatory final thesis must be implemented for the Bachelor's degree.

One important issue, which the experts discuss with the programme coordinators and the students, is the fact that the curriculum of the Bachelor's programme includes a graduation project (Bachelor's thesis) and the question, why this course is not compulsory for all students. Currently, the option to conduct a graduation project is only offered to Bachelor's students with a GPA above 2.5. Students with a GPA below 2.5 are required to take the

following three courses: “E-Commerce”, “Distributed Database”, and “Advanced Topics in Information Technology”. The experts point out, that conducting the graduation project should not be only an option but needs to be a compulsory component of the bachelor’s degree programme Information Technology for all students.

A 11. (ASIIN 2.2) The reasons for the high dropout rates of students need to be analysed systematically. Measures must then be derived to counteract the high dropout rates.

VLUTE submits updated information on the number of drop-out in both programmes.

The table below shows that the rate of drop-out students in the Bachelor’s degree programme Information Technology was around 12 % but has decreased in recent academic years.

Cohort year (academic year)	Applicants	Enrolled students	Number of drop-out students (rate)
K41 (2016-2020)	395	136	13 (9,6%)
K42 (2017-2021)	439	241	15 (6,2%)
K43 (2018-2022)	583	238	12 (5,0%)
K44 (2019-2023)	482	248	10 (4,0%)
K45 (2020-2024)	701	265	7 (2,6%)
K46 (2021-2025)	953	300	6 (2,0%)
K47 (2022-2026)	1063	337	4 (1,2%)
K48 (2023-2027)	1003	332	0 (0%)

The main reasons for undergraduate students for dropping out are economic difficulties and that students decide to enrol in other majors.

According to the provided statistics, VLUTE had no students dropping out of the Master's degree programme Information Technology from 2020 to 2023. This data is reasonable because master’s students usually have distinct orientation and know what career and study plan they want to follow. The statistics are shown in the following table:

Cohort year (academic year)	Applicants	Enrolled students	Number of drop-out postgraduate students (rate)
K1 (2020-2022)	19	19	0 (0%)
K2 (2021-2023)	8	8	0 (0%)
K3 (2022-2024)	24	24	0 (0%)
K4 (2023-2025)	9	9	0 (0%)

The experts see that the drop-out rates are reasonable and there is no need for further action.

Additional topics:

Criterion 1.3 Curriculum

The experts notice that there are three courses in the curriculum of the Bachelor's degree programme Information Technology (Techniques and Tactics for Infantry Fighting, General Military, Defense and Security Work), which do not belong to study programme in Information Technology but are rather substitutes for military service. As these courses are compulsory all Vietnamese undergraduate students at VLUTE, the experts suggest to remove these courses from the official curriculum and to offer them as separate courses. The scores of these courses should not be included in the student's cumulative GPA, and students will receive certificates of recognition for their accomplishment of these courses. VLUTE is free to find another solution, but separate military training from studying.

Criterion 1.5 Work Load

The experts perceive that the underlying Vietnamese credit point system makes use of a fixed amount of contact hours and hours required for self-studies. However, the semester workload indicates the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study, and examinations) and these need to be ascribed separately to each component of the curriculum.

The experts point out that VLUTE should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. 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: some progress more quickly, while others progress more slowly. Therefore, the workload estimate should be based on the time an “average student” spends on self-studies and preparation for classes and exams. The initial estimation should then be verified via students’ questionnaires.

The experts suggest directly asking the students about their total work load. This could e.g. be done by including a respective question in the course questionnaires. By European standards, 30 ECTS credits should be awarded per semester. By correctly displaying students’ workload in ECTS credits, VLUTE would facilitate academic mobility and better support their graduates if they apply for international programmes.

In any case, VLUTE must make sure that the actual workload of the students and the awarded credits correspond with each other and make that information transparent in the module descriptions.

Criterion 3.1

The experts discuss with the programme coordinators and the teachers about the number of academic staff members with a PhD. As mentioned in the Self-Assessment Report, in the Bachelor’s degree programme Information Technology, there are 38 teachers involved in the programme, but only one is an associate professor and only three have a PhD. The details are shown in the table below:

No.	Academic rank	Master	Engineer	Note
1	Associate Professor	02	01	Lecturer
2	Ph.D.	09	02	
3	Master	00	29	
4	Postgraduate students	00	06	Teaching assistant
Total		11	38	

The programme coordinators explain that VLUTE has applied for additional funds to support teachers with a Master's degree who want to join a PhD programme. In recent years, seven teachers from the Faculty of Information Technology have joint PhD programmes. The experts support these efforts and recommend to further increase the share of teachers with a PhD in the Bachelor's programme.

Criterion 4.1 Module Descriptions

The experts point out the provided module descriptions for both programmes do not follow an internationally accepted template and that the course objectives and course learning outcomes need to be aligned with the programmes' scientific level.

The experts emphasise that the CO and CLO need to reflect the academic level of a study programme, because they define the knowledge, skills, and competencies that students are expected to acquire, and these expectations must align with the nature of the programme. For example, at the Master's level, students are expected to engage in more complex, analytical, and critical thinking compared to undergraduate studies. The CO and CLO should reflect this by emphasising higher-order cognitive skills such as analysis, synthesis, evaluation, and application of knowledge in real-world or research contexts. To this end, the experts suggest using an internationally accepted taxonomy (e.g. Bloom's Taxonomy) for updating the CO and CLO of both programmes.

Taking into account the additional information and the comments given by VLUTE experts summarise their analysis and **preliminary assessment** for the award of the seals as follows:

Assessment and analysis for the award of the Euro-Inf® Label:

The experts confirm that the intended learning outcomes of the degree programmes comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	With requirements for one year	Euro-Inf®	30.09.2030
Ma Information Technology	With requirements for one year	Euro-Inf®	30.09.2030

Possible Requirements

For all degree programmes

- A 1. (ASIIN 1.5, 4.1) Verify the students' total workload for each course and make that information transparent in the module descriptions.
- A 2. (ASIIN 4.1) Update the module handbooks with respect to the course objectives (CO) and the course learning outcomes (CLO).
- A 3. (ASIIN 4.2) Issue a Diploma Supplement, which should be aligned with the European template, to all graduates.
- A 4. (ASIIN 4.3) Issue a guideline on how to support students with disabilities so that they can achieve the intended learning outcomes.

For Ba Information Technology

- A 5. (ASIIN 1.3) Remove the courses "Techniques and Tactics for Infantry Fighting", "General Military", and "Defense and Security Work" from the official curriculum.
- A 6. (ASIIN 1.3) Include a compulsory final project (Bachelor's thesis) for all students in the curriculum of the Bachelor's programme.

Possible Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to use a template for the module descriptions that is aligned with international standards.
- E 2. (ASIIN 1.3) It is recommended to further improve students' and teachers' English proficiency.

I Resumption of the procedure for the Bachelor's Programme Information Technology and the Master's Programme Information Technology (14.11.2024)

E 3. (ASIIN 1.5) It is recommended to award ECTS points for each course in addition to Vietnamese credits.

For Ba Information Technology

E 4. (ASIIN 3.2) It is recommended to further increase the share of teachers with a PhD in the Bachelor's programme.

For Ma Information Technology

E 5. (ASIIN 1.3) It is recommended to increase, the share of practical work in the Master's programme.

Comment of the University (11.11.2024)

Vinh Long University of Technology Education provides the following statement on the report about the resumption of the procedure:

Experts	Response VLUTE
A 1. (ASIIN 1.5, 4.1) Verify the students' total workload for each course and make that information transparent in the module descriptions	We have updated all syllabi including the students' total workload for each course and clarify information in the module descriptions. Besides, we updated ECTS credits in academic transcript, diploma supplement, all syllabi and curriculum.
A 2. (ASIIN 4.1) Update the module handbooks with respect to the course objectives (CO) and the course learning outcomes (CLO).	The course objectives (CO) and the course learning outcomes (CLO) are updated on all syllabi of courses.
A 3. (ASIIN 4.2) Issue a Diploma Supplement, which should be aligned with the European template, to all graduates.	In 2024, VLUTE issued a Diploma Supplement and Academic transcript which should be aligned with the European template to all graduates.
A 4. (ASIIN 4.3) Issue a guideline on how to support students with disabilities so that they can achieve the intended learning outcomes.	In November 2024, VLUTE issued Decision No.205/QD-DHSPKTVL to publish a guideline on how to support students with disabilities so that they can achieve the intended learning outcomes.

<p>A 5. (ASIIN 1.3) Remove the courses “Techniques and Tactics for Infantry Fighting”, “General Military”, and “Defense and Security Work” from the official curriculum.</p>	<p>In curriculum ver.2024, we have changed the courses “Techniques and Tactics for Infantry Fighting”, “General Military”, and “Defense and Security Work” from the official training program to Conditional courses.</p>
<p>A 6. (ASIIN 1.3) Include a compulsory final project (Bachelor's thesis) for all students in the curriculum of the Bachelor's programme.</p>	<p>In the Information Technology Engineering's program ver.2024, we have removed the substitute courses (TH1606 - E-commerce; TH1607- Distributed database; TH1608 - Advanced topics in Information Technology) and all students have to complete the Graduation thesis.</p>
<p>E 1. (ASIIN 1.3) It is recommended to use a template for the module descriptions that is aligned with international standards.</p>	<p>We have added some information align with international standards to clarify and support to international students in joining the courses at VLUTE.</p>
<p>E 2. (ASIIN 1.3) It is recommended to further improve students' and teachers' English proficiency.</p>	<ul style="list-style-type: none"> - The updated curriculum includes a B1 English proficiency requirement for the Information Technology Engineering program and a B2 requirement for the Information Technology Master's program. - In 2025, VLUTE will sign an MOU with the IIG to provide training and international English certification exams to be able to communicate and work in an international environment. - VLUTE has had exchange programs of the students and teachers with Korea Tech in many recent years and will increase the number of exchanges in the near future. - VLUTE will invite several native English-speaking faculty teaching staffs and some IT teaching staffs to participate in teaching specialized courses in English. - In addition, we have updated some syllabi which are taught in English and Vietnamese. We also had a course of English for Information Technology. - Furthermore, we will provide some kind of teaching methods like presentations, exercises, references in English.

	- We had a plan to support teaching staff pursue the Bachelor's degree in English language major.
E 3. (ASIIN 1.5) It is recommended to award ECTS points for each course in addition to Vietnamese credits.	In 2024, VLUTE issued Guidelines No.37/HD-DHSPKTVL to award ECTS points for each course in addition to Vietnamese credits. - In all syllabi, curriculum of two programs, Academic transcript, Diploma supplement are awarded ECTS points in addition to Vietnamese credits.
E 4. (ASIIN 3.2) It is recommended to further increase the share of teachers with a PhD in the Bachelor's programme.	- In 2025, we will have a plan to train 07 Teaching staff to further increase the share of teachers with a PhD in the Bachelor's programme.
E 5. (ASIIN 1.3) It is recommended to increase the share of practical work in the Master's programme.	For Master's program in IT ver.2024, we updated some courses to increase the share of practice hours. - (Ex: Big data processing, Distributed systems, Parallel processing...)

Final comment of the Experts (14.11.2024)

The experts thank VLUTE for their statement and the provided documents.

With respect to the students' total workload, the experts point out that VLUTE needs to ask the students about the time they spend on classes and especially on self-studies. Afterwards, VLUTE needs to analyse the results and update the information on students' workload in the module descriptions and adjust the awarded ECTS points. For this reason, requirement A1 remains as proposed.

VLUTE has submitted an updated module handbooks, but the experts did not have enough time to look through the newly worded course objectives (CO) and the course learning outcomes (CLO). For this reason, requirement A2 remains as proposed.

The experts confirm that VLUTE issues a Diploma Supplement to all of its graduates, which is aligned with the European template. For this reason, the respective requirement (A3) can be cancelled.

The experts confirm that VLUTE has a guideline on how to support students with disabilities. For this reason, the respective requirement (A4) can be cancelled.

The experts confirm that VLUTE has removed the courses “Techniques and Tactics for Infantry Fighting”, “General Military”, and “Defense and Security Work” from the list of compulsory courses. For this reason, the respective requirement (A5) can be cancelled.

The experts confirm that all Bachelor’s students now have to complete the graduation project. For this reason, the respective requirement (A6) can be cancelled.

The recommendation stand as proposed and VLUTE has the chance to implement the suggested improvements in the further course of the accreditation procedure.

Taking into account the additional information and the comments given by VLUTE experts summarise their analysis and **final assessment** for the award of the seals as follows:

Assessment and analysis for the award of the Euro-Inf® Label:

The experts confirm that the intended learning outcomes of the degree programmes comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	With requirements for one year	Euro-Inf®	30.09.2030
Ma Information Technology	With requirements for one year	Euro-Inf®	30.09.2030

Requirements

For all degree programmes

- A 1. (ASIIN 1.5, 4.1) Verify the students’ total workload for each course and make that information transparent in the module descriptions.
- A 2. (ASIIN 4.1) Update the module handbooks with respect to the course objectives (CO) and the course learning outcomes (CLO).

Recommendations

For all degree programmes

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- E 1. (ASIIN 1.3) It is recommended to use a template for the module descriptions that is aligned with international standards.
- E 2. (ASIIN 1.3) It is recommended to further improve students' and teachers' English proficiency.
- E 3. (ASIIN 1.5) It is recommended to award ECTS points for each course in addition to Vietnamese credits.

For Ba Information Technology

- E 4. (ASIIN 3.2) It is recommended to further increase the share of teachers with a PhD in the Bachelor's programme.

For Ma Information Technology

- E 5. (ASIIN 1.3) It is recommended to increase, the share of practical work in the Master's programme.

J Comment of the Technical Committee 04 – Informatics/Computer Science (21.11.2024)

Assessment and analysis for the award of the ASIIN seal:

TC discusses the procedure and is of the opinion that requirement A 1 is not quite complete, as the TC understands the report to mean that not only the workload of the students should be checked, but that corresponding workload-based credit points should also be awarded. Therefore, the TC is in favour of adding the passage “and award credit points accordingly” to requirement A1. Otherwise, the TC follows the experts’ assessment without any changes.

Assessment and analysis for the award of the Euro-Inf[®] label:

The Technical Committee deems that the intended learning outcomes of the degree programmes do comply with the Subject-Specific Criteria of the Technical Committee 04 – Informatics/Computer Science.

The Technical Committee 04 – Informatics/Computer Science recommends the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ba Information Technology	With requirements for one year	Euro-Inf [®]	30.09.2030
Ma Information Technology	With requirements for one year	Euro-Inf [®]	30.09.2030

Vote: unanimous (Prof. Schneider does not participate at the vote)

Requirements

For all degree programmes

- A 1. (ASIIN 1.5, 4.1) Verify the students’ total workload for each course and award credit points accordingly and make that information transparent in the module descriptions.
- A 2. (ASIIN 4.1) Update the module handbooks with respect to the course objectives (CO) and the course learning outcomes (CLO).

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to use a template for the module descriptions that is aligned with international standards.
- E 2. (ASIIN 1.3) It is recommended to further improve students' and teachers' English proficiency.
- E 3. (ASIIN 1.5) It is recommended to award ECTS points for each course in addition to Vietnamese credits.

For Ba Information Technology

- E 4. (ASIIN 3.2) It is recommended to further increase the share of teachers with a PhD in the Bachelor's programme.

For Ma Information Technology

- E 5. (ASIIN 1.3) It is recommended to increase, the share of practical work in the Master's programme.

K Decision of the Accreditation Commission (06.12.2024)

Assessment and analysis for the award of the ASIIN seal:

The AC discusses the procedure and follows the suggestion of TC 04 complete of adding a passage to requirement A1. Otherwise, the AC follows the experts' assessment without any changes.

Assessment and analysis for the award of the Euro-Inf[®] label:

The Technical Committee decides that the intended learning outcomes and content of the degree programmes comply with the criteria of the Euro-Inf[®] label.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Information Technology	With requirements for one year	Euro-Inf [®]	30.09.2030
Ma Information Technology	With requirements for one year	Euro-Inf [®]	30.09.2030

Requirements

For all degree programmes

- A 1. (ASIIN 1.5, 4.1) Verify the students' total workload for each course and award ECTS points accordingly and make that information transparent in the module descriptions.
- A 2. (ASIIN 4.1) Update the module handbooks with respect to the course objectives (CO) and the course learning outcomes (CLO).

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to use a template for the module descriptions that is aligned with international standards.

- E 2. (ASIIN 1.3) It is recommended to further improve students' and teachers' English proficiency.
- E 3. (ASIIN 1.5) It is recommended to award ECTS points for each course in addition to Vietnamese credits.

For Ba Information Technology

- E 4. (ASIIN 3.2) It is recommended to further increase the share of teachers with a PhD in the Bachelor's programme.

For Ma Information Technology

- E 5. (ASIIN 1.3) It is recommended to increase, the share of practical work in the Master's programme.

Appendix: Programme Learning Outcomes and Curricula

According to the curriculum the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Bachelor degree programme Information Technology:

General objectives:

Learners will be expected to become all-round IT engineers with

- Political qualities, professional ethics to meet the requirements of security, national defense and socio-economic activities
- General knowledge of natural and social sciences and foundational knowledge of information technology;
- Fundamental knowledge in computer networks and communications, computer science, IoT and information security;
- Advanced knowledge and skills in computer network and communications, computer science, IoT and information security;
- Necessary social skills, self-study ability, self-learning ability for success in life and career.

Particular objectives:

- PO1: Establish knowledge of political theory, knowledge of national defense and security, awareness of Party's guidelines and policies, and laws of the State;
- PO2: Establish knowledge of natural sciences supporting the specialized study in IT;
- PO3: Provide learners awareness about concepts related to IT such as hardware, database, computer programming, computer network, and practical applications of information technology;
- PO4: Develop learner's skills in hardware, software programming, information systems analysis and design, network design and administration, website design and administration;
- PO5: Develop working skills in the specialized fields of information technology such as Computer Network and Communication, Computer Science, IoT and Information Security;

- PO6: Promote self-control and self-responsibility attitude of learners; an awareness about industrial safety and hygiene; create an industrial style, a work passion and professional ethics; ensure health; be responsible to society and community.
- PO7: Develop learner’s abilities in some activities such as exchanging academic, reading references in English, preparing and presenting documents, reports and seminars, mastering both the general applications and the specialized software and tools.

Expected Learning Outcomes

EXPECTED LEARNING OUTCOMES	PARTICULAR OBJECTIVES						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I. KNOWLEDGE							
PLO01: Be aware and implement the Party’s guidelines and policies, and laws of the State;	✓					✓	
PLO02: Master and effectively apply knowledge of natural sciences, physical education and national defense and security into real life.	✓	✓				✓	
PLO03: Have good expertise (e.g., knowledge of computing systems, operating system and so on) to adapt to different jobs in IT; strengthening logical thinking about programming and programming languages; expand the understanding of data structures, algorithms; be able to edit the official dispatch and documents and to master general office applications.			✓	✓		✓	✓
PLO04: Conceive information systems, programming languages, artificial intelligence, IoT and their practical applications.			✓	✓		✓	✓
PLO05: Demonstrate good expertise and apply specialized knowledge of Computer					✓	✓	✓

EXPECTED LEARNING OUTCOMES	PARTICULAR OBJECTIVES						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Network and Communication, Computer Science, IoT and Information Security.							
II. SKILLS							
PLO06: Apply design thinking synthesized from general knowledge and professional knowledge.			✓			✓	
PLO07: Research, apply, exploit and transfer IT products.			✓	✓	✓	✓	✓
PLO08: Manage IT projects; develop and deploy public administrative services and e-commerce; design and administrate website.				✓	✓	✓	✓
PLO09: Communicate for expertise exchange; read professional references in English; prepare and present reports and seminars; use modern tools and media effectively			✓	✓	✓		✓
PLO10: Develop enterprise network systems from consulting to maintaining; approach new network technology and master network security.				✓	✓	✓	✓
PLO11: build and deploy systems applying IT; analyze and design practically valuable and creativity software, especially intelligent applications based on data mining, semantic analyzing and natural language processing.				✓	✓	✓	✓
PLO12: develop embedded software in civil applications, communication devices and industry; consult, design, implement and maintain automatic systems and embedded systems.				✓	✓	✓	✓
PLO13: Consult, design and deploy enterprise network systems with the security solutions; analyze and evaluate risks and propose security solutions for information systems.				✓	✓	✓	✓
III. SELF-CONTROL AND SELF-RESPONSIBILITY ATTITUDE							
PLO14: demonstrate ability to work independently, teamwork skills under	✓	✓	✓	✓	✓	✓	✓

EXPECTED LEARNING OUTCOMES	<i>PARTICULAR OBJECTIVES</i>						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
different working conditions; demonstrate self responsibility attitude and be responsible to working group.							
PLO15: Guide and supervise other people performing specific tasks.	✓	✓	✓	✓	✓		✓
PLO16: Demonstrate self-directed attitude; make professional decision and defend personal opinions.	✓	✓	✓	✓	✓	✓	✓
PLO17: Plan, coordinate and manage resources; evaluate and improve the performance of activities.	✓	✓	✓	✓	✓	✓	✓

The following **curriculum** is presented:

Number	Course code	Courses	Credits			Compulsory	Elective	Prerequisite courses/ Corequisite courses	Parallel semester	Implementation semester	Credit ECTS
			Total	Theory	Practice						
General knowledge											
1	CT2101	Marxist-Leninist philosophy	3	3	0	x				1	4,5
2	CT2102	Marxist-Leninist political economy	2	2	0	x		CT2101		1	3,0
3	CT2103	Scientific socialism	2	2	0	x		CT2101		2	3,0
4	CT2104	History of the Communist Party of Vietnam	2	2	0	x		CT2101		3	3,0
5	CT2105	The work of preventing and combating the corruption, the wastes and the negativities	2	2	0	x				4	3,0
6	CT1102	Ho Chi Minh's Ideology	2	2	0	x		CT2101		7	3,0
7	UL1104	General law	2	2	0	x				1	3,0
8	EC1600	<i>Start-up</i>	1	1	0	x				8	1,5
9	EC1217	<i>Accounting principles</i>	2	2	0					7	3,0
10	UL1106	<i>State administrative management and management of the education and training sector</i>	2	2	0		<i>Choosing 1 of 2 courses</i>			7	3,0

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11	CB1106	Advanced Mathematics A1	3	3	0	x				1	4,5
12	CB1107	Advanced Mathematics A2	3	3	0	x		CB1106		2	4,5
13	CB1111	General Physics A1	3	3	0		<i>Choosing 1 of 2 courses</i>			2	4,5
14	CB1109	Probability and statistics	3	3	0					2	4,5
15	TH1114	Informatics	3	2	1	(*)					5,0
16	NN1101	English 1	3	3	0	(*)					4,5
17	NN1102	English 2	3	3	0	(*)					4,5
18	NN1103	English 3	4	4	0	(*)					6,0
19	NN1103	English 4	4	4	0	(*)					6,0
20	TC1101	General Physics A1	1	0	1	(*)					2,0
21	TC1102	General Physics A2	1	0	1	(*)					2,0
22	TC1103	General Physics A3	1	0	1	(*)					2,0
23	QP2101	National defense and security policy of the Communist Party of Vietnam	3	3	0	(*)					4,5
24	QP2102	National Defense and security work	2	2	0	(*)					3,0
25	QP2103	General Military	1	0	1	(*)					2,0
26	QP2104	Techniques and tactics for infantry fighting	2	0	2	(*)					4,0
Total: 44 Credits (39 Credits Compulsory, 5 Credits Elective, 43 Credits Theory, 1 Credits Practice)											69,0
<i>Fundamental knowledge</i>											
1	TH1201	Computing essentials	2	2	0	x			TH1203	1	3,0
2	TH1203	Discrete mathematics	2	2	0	x			TH1201	1	3,0
3	TH1219	Basic programming	4	2	2	x		TH1201	TH1207	2	7,0
4	TH1205	Computer architecture	3	2	1	x		TH1201	TH1219	2	5,0

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5	TH1206	Data structures and algorithms	3	2	1	x		TH1219	TH1209	3	5,0
6	TH1207	Database	3	2	1	x				2	5,0
7	TH1208	Operating systems	3	2	1	x		TH1205		3	5,0
8	TH1209	Object-oriented programming	3	2	1	x		TH1219	TH1206	3	5,0
9	TH1227	Editing and writing documents	2	1	1	x				1	3,5
10	DT1283	Digital systems in Information Technology	2	1	1	x				4	3,5
11	TH1212	Algorithm analysis and design	2	2	0	x		TH1206		4	3,0
12	TH1216	Open_source software	2	1	1	x				4	3,5
13	TH1214	Computer network	3	2	1	x		TH1208	TH1216	4	5,0
14	TH1217	Occupational safety and hygiene in IT sector	1	1	0	x				3	1,5
15	TH1507	Information technology project 1	1	0	1	x				6	2,0
16	TH1521	Assembling and setting up the computer	2	0	2		<i>Choosing 1 of 2 courses</i>			2	4,0
17	TH1522	Applied Informatics	2	0	2					2	4,0
Total: 38 Credits (36 Credits Compulsory, 2 Credits Elective, 24 Credits Theory, 14 Credits Practice)											66,0
<i>Professional knowledge</i>											
1	TH1354	English for Information Technology	2	2	0	x				3	3,0
2	TH1333	Artificial intelligence	3	2	1	x		TH1206		6	5,0
3	TH1359	Internet of things	3	2	1	x		TH1214		5	5,0
4	TH1335	Image processing	3	2	1	x		TH1397		5	5,0

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5	TH1305	Information systems analysis and design	3	2	1	x		TH1207		3	5,0
6	TH1324	Object-oriented analysis and design	3	2	1	x				6	5,0
7	TH1336	Web programming	4	2	2	x		TH1209		5	7,0
8	TH1309	Java programming	3	2	1	x		TH1209		4	5,0
9	TH1397	dotNET programming	4	2	2	x		TH1209	TH1336	4	7,0
10	TH1338	Application programming for mobile devices	4	2	2	x				5	7,0
11	TH1376	Sensors and applications	3	1	2	x		TH1359		3	5,5
12	TH1369	IoT application development	3	1	2	x		TH1336		6	5,5
13	TH1512	Information technology project 2	2	0	2	x				7	4,0
14	TH1358	Web application security	3	2	1		<i>Choosing 1 of 2 courses</i>	TH1336		6	5,0
15	TH1307	Database management systems	3	2	1			TH1207		6	5,0
Choosing 1 of 4 Specialization:											79,0
1. Specialization in Computer Network and Communication											
2. Specialization in Information Security											
3. Specialization in Internet of Things (IoT)											
4. Specialization in Cloud computing											
Specialization in Computer Network and Communication											
1	TH1339	Computer network administration	3	1	2	x		TH1214		5	5,5
2	TH1341	Information safety and security	3	2	1	x		TH1214		7	5,0
3	TH1314	Network programming	3	2	1	x		TH1214		7	5,0

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4	TH1342	Wireless networking technology	2	1	1	x		TH1214		6	3,5
5	TH1316	Computer network design	3	2	1	x		TH1214		6	5,0
6	TH1370	Deploying the office network systems	3	1	2	x		TH1316		7	5,5
7	TH1526	Optical communication systems	2	0	2	x				7	4,0
Specialization in Information Security											
1	TH1395	Cloud computing	2	2	0	x		TH1214		5	3,0
2	TH1363	Database security	3	2	1	x		TH1207		7	5,0
3	TH1364	Computer network security	3	2	1	x		TH1214		7	5,0
4	TH1365	Network attack (Cyber-attack)	3	2	1	x		TH1214		6	5,0
5	TH1366	Malware analysis techniques	3	2	1	x		TH1208		6	5,0
6	TH1367	Risk management and information security in the enterprises	2	2	0	x				7	3,0
7	TH1368	Cloud computing security	3	2	1	x		TH1395		7	5,0
Specialization in Internet of Things (IoT)											
1	TH1355	Embedded system	3	1	2	x		TH1208		5	5,5
2	TH1356	IoT network	3	2	1	x		TH1214		6	5,0
3	TH1357	Advanced IoT application development	3	1	2	x		TH1369		6	5,5
4	TH1377	IoT security	3	2	1	x				7	5,0
5	TH1360	Big data analytics for IoT	3	2	1	x		TH1369	TH1357	7	5,5
6	TH1361	Machine learning for IoT	2	1	1	x		TH1369		7	3,5
7	TH1362	Cloud computing for IoT	2	1	1	x		TH1369		7	3,5
Specialization in Cloud computing											

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1	TH1340	Distributed systems	3	2	1	x		TH1309		7	5,0
2	TH1387	Open-Source Operating systems	2	1	1	x		TH1208		6	3,5
3	TH1379	Virtualization technology	3	1	2	x				7	5,5
4	TH1395	Cloud computing	3	2	1	x		TH1214		6	5,0
5	TH1378	Cloud computing application development	3	2	1	x		TH1395		7	5,0
6	TH1339	Computer network administration	3	1	2	x		TH1214		5	5,5
7	TH1362	Cloud computing for IoT	2	1	1	x		TH1369		7	3,5
Total: 62 Credits (59 Credits Compulsory, 3 Credits Elective, 33 Credits Theory, 39 Credits Practice)											33,0
<i>Internship and Graduation Project</i>											
1	TH1628	Graduation internship	5	0	5	x				8	10,0
2	TH1602	Graduation project	10	0	10		x			8	20,0
Total: 15 Credits (5 Credits Compulsory, 10 Credits Elective, 0 Credits Theory, 15 Credits Practice)											
<i>Substitute for graduation project</i>											
1	TH1606	E-commerce	3	2	1		x	TH1336		8	5,0
2	TH1607	Distributed database	3	2	1		x	TH1207		8	5,0
3	TH1608	Advanced topics in Information Technology	4	2	2		x			8	7,0
Total: 15 Credits (5 Credits Compulsory, 10 Credits Elective, 6 Credits Theory, 9 Credits Practice)											27,0
										TỔNG ECTS:	274,0

According to the curriculum the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master degree programme Information Technology:

Objectives

In order to meet the social demand for human resources with high expertise in Information Technology (IT), this curriculum is built to educate master's degree in IT with the following objectives. First of all, providing advanced knowledge in IT helps learners widen their professional knowledge. The second objective is the improvement of interdisciplinary knowledge between the IT and other fields. Moreover, it brings opportunity for learners to have in-depth study in one of the specialized IT fields. In addition, it provides master students with capability to work independently, think creatively and flexibly solve problems in the IT industry.

The curriculum of Master in Information Technology aims to educate masters with political and ethical qualities; to provide general knowledge and research methods on IT; to provide capability to detect and implement research in order to solve practical problems of a common or in-depth nature; to provide capability of imparting IT knowledge; to acquire in-depth and up-to-date knowledge of information technology; to have scientific working methods, systematic logical thinking; to be able to communicate and work effectively in a team and integrate in an international environment.

Graduated master students are expected to work at job positions:

- Working at enterprises (CTO, CIO, CEO, Senior Engineer,...);
- Working in domestic and foreign consulting companies on proposing solutions, building and maintaining information systems, systems of computer network and communication;
- Being capable of planning, projecting, organizing, operating and managing information technology projects in agencies and enterprises;
- Being able to well undertake research in IT research and development departments;
- Having the ability to become programmers, IT system administrators in enterprises;
- Being able to become researchers, teachers in information technology at Institutes, Research Centers and Training Facilities;
- Having the ability to develop study at the Ph.D degree.

Expected Learning Outcomes

Graduates of a master's curriculum in IT must meet the following output standards:

Knowledge:

- Master expertise extending from the knowledge acquired at university to access new technologies;
- Know how to flexibly apply the combination of knowledge areas in professional activities; be well-adapted to different occupations in IT;
- Widen personal professional knowledge in order to: synthesize, analyze, and evaluate the current state of applying IT at agencies, businesses, and schools; specify the strengths and the weaknesses of IT solutions; propose innovative solutions or improve the existing solutions in order to bring economic efficiency and high performance in implementation.

Skills:

- Demonstrate ability to do research and grasping new technologies;
- Be able to apply learned knowledge to their research in order to develop products and applications in IT projects;
- Hold flexible problem-solving skills to meet complex tasks;
- Demonstrate the scientific working method, the strategic vision and the ability to solve IT problems;
- Be able to detect, discuss and propose valuable ideas and solutions for the specific problems in reality;
- Be capable of consulting, designing, implementing, conducting, and managing information systems and software products at agencies and business;
- Communicate and work in groups effectively; immediately adapt to highly competitive environment and the changes in IT;
- Reach at least B1 or equivalents according to the Common European Framework of Reference for Languages for English level; be able to integrate well into the international working environment.

Attitudes:

- Demonstrate capability of teamwork, working independently and creatively, communicating with colleagues and partners effectively, and being well-adapted to the constant change of the working environment
- Become responsible and honest IT masters with a professional working style and logical thinking; obey the law and have the right attitude, professional passion and professional ethics.

The following **curriculum** is presented:

No.	Course code		Courses	Credits VN			Credits ECTS
	Letter	No.		Total	Theory	Practice	
I	General knowledge			15	15	0	22,5
1	CT	101	Philosophy	3	3	0	4,5
2	NN	101	English A1 (*)	3	3	0	4,5
3	NN	102	English A2 (*)	3	3	0	4,5
4	NN	103	English B1 (*)	4	4	0	6,0
5	SP	101	Scientific research methodology	2	2	0	3,0
II	Core fundamental knowledge			11	7	4	10,0
6	TH	201	Advanced algorithm analysis and design	3	2	1	5,0
7	TH	202	Advanced database systems	3	2	1	5,0
	<i>Choose 2 out of 3 courses</i>			5	3	2	8,5
8	TH	203	Advanced artificial intelligence	3	2	1	5,0
9	TH	204	Advanced image processing	2	1	1	3,5
10	TH	205	Geographic information systems	2	1	1	3,5
III	Specialized knowledge			24	16	8	15,0
11	TH	304	IT project management	3	2	1	5,0
12	TH	305	Big data processing	3	2	1	5,0
13	TH	306	Advanced computer network	3	2	1	5,0
	<i>Choose 5 out of 6 courses</i>			15	10	5	25,0
14	TH	301	Distributed systems	3	2	1	5,0
15	TH	302	Semantic web and data mining	3	2	1	5,0
16	TH	303	Parallel processing	3	2	1	5,0

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17	TH	307	Advanced topic 1: Information safety and security	3	2	1	5,0
18	TH	308	Advanced topic 2: 3D geometry modeling	3	2	1	5,0
19	TH	309	Advanced topic 3: Modeling and building service-oriented systems	3	2	1	5,0
IV	Graduation			14	14	0	21,0
20	TH	601	Graduation thesis	14	14	0	21,0
Total				64	52	12	102,0